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roblems of Economics

Selected Articles from Soviet Economics Journals in English Translation

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I. Osadchaia: The Theory of "Balanced Growth" (On R. Harrod's Book Towards a Dynamic Economics) (Mirovaia Ekonomika i Mezhdunarodnye Otnosheniia, 1961, No. 3)

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Voprosy Ekonomiki, 1961, No. 7

. VASIL'EV

The Level of Per Capita Agricultural Production in the U.S.S.R.

The creation of an abundance of farm produce in ıe country is directly related to the solution of the asic economic problem of the USSR.

For our planned economy, in determining the level nd rate of development of socialist agriculture in ıe country as a whole and in individual economic re- ions, the per capita output of farm produce is of xceptional significance. This index makes possible more correct appraisal of both the successes and hortcomings in agricultural production (by types, istricts, rates of growth, satisfaction of the needs f the population and the country as a whole); it llows for an analysis not only of quantitative but of ualitative changes in the composition of production. his index plays a very large role in comparing the esults of the peaceful economic competition with the apitalist countries in the solution of the basic eco- omic problem, as well as in the solution of major ational economic problems.

***

During the years of Soviet power, especially since 953, socialist agriculture has scored significant uccesses. In 1960 the gross output of agriculture as 2.2 times greater than in 1913. In the years 954 to 1958 our country produced (on a yearly aver- ge basis) more than tsarist Russia produced on the ame territory in 1909-1913, as follows: grain — 0.7 million tons, or 56.1% (including 31.8 million ns, or 184.9% of marketable grain); raw cotton — .52 million tons, or 517.6%; sugar beet (factory) — 5.4 million tons, or 251.5%; oil-bearing seeds — .86 million tons, or 286%; flax fiber — 84 thousand ns, or 26.6%; potatoes — 52.8 million tons, or 72.5% (including marketable potatoes — 8.8 million ns, or 157.1%); vegetables — 8.5 million tons, or 54.5% (including marketable vegetables — 5.7 mil- on tons, or 518.2%; meat and lard (in slaughter eight) — 2.1 million tons, or 43.8% (including mar- etable meat and lard — 2.3 million tons, or 134%); ilk — 19.9 million tons, or 69.1% (including marketable milk — 13.4 million tons, or 197.1%); eggs — 8.9 billion, or 79.5% (including marketable eggs — 2.6 billion, or 60.5%); wool — 80 thousand tons, or 41.7% (including marketable wool — 154 thousand tons, or 3 times more).

The sown area of our country increased between 1913 and 1960 by 84.8 million hectares, or by 71.7%; cattle increased (between January 1, 1916 and January 1, 1961) by 17.4 million head, or 29.8% (including cows — 6 million, or 20.8%); pigs increased by 35.6 million, or 154.8%, and sheep by 43.3 million, or 48.3%. The crop yield and livestock productivity indices have somewhat improved. All this has been achieved through the socialist reconstruction of agriculture and the growth of labor productivity, while the number of persons employed in agriculture has significantly decreased.

The successes achieved in developing socialist agriculture are a source of joy to the Soviet people, but the growth of agricultural output has not been adequate and does not correspond to the growing needs of the people. At the January 1961 Plenum of the CPSU Central Committee and at subsequent zonal conferences of leading workers in agriculture, the discrepancy between the level of agricultural output achieved and the needs of the national economy was clearly shown and reasons were given to explain why the development of our agriculture is still behind the growing demand of the population.

It should be remembered that per capita production in pre-revolutionary Russia was far below that in the US and many other capitalist countries, and was also far below what the Soviet citizen needs today to meet his growing needs and purchasing power in view of the general growth of his real income under Soviet power. Hence the increase in gross agricultural output by 2.2 times, and the increased output of the most important agricultural products (gross and marketable) on the scale indicated above, are far from sufficient either in total volume or in rate of growth. We present some data on per capita agricultural output in the USSR and the USA (see Table 1 shown on the following page).

It must be pointed out that prior to World War I

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Table 1

Per Capita Output of the Most Important Types of Agricultural Products (in Kg.)*

Type of Product	Yearly average in USSR					Required for abundance of agricultural produce in USSR	Yearly average in USA					USSR in % of USA				
	1909—1913	1949—1953	1954—1958	1959	1960		1909—1913	1949—1953	1954—1958	1959	1960	1909—1913	1949—1953	1954—1958	1959	1960
Grain (all grain crops)	467,7	437,6	566,0	598,0	622,0	1 000	1 168	911	922	1 045	1 080	40,0	48,0	61,4	57,2	57,6
Sugar beet	65,2	114,1	177,5	210,5	265,5	400	47	75	84	87	83	138,7	152,1	211,3	242,0	319,9
Raw cotton	4,4	18,9	21,0	22,4	20,5	40	86	56	45	54	51,9	5,1	33,8	46,7	41,5	39,5
Flax fiber	2,0	1,2	2,0	1,7	2,0	5	—	—	—	—	—	—	—	—	—	—
Sunflower seeds	4,8	11,1	17,1	14,6	17,9	23—25	—	—	—	—	—	—	—	—	—	—
Potatoes	197,4	409,5	417,0	411,0	392,0	650	104	67	65	62	65	189,8	611,2	641,5	662,9	603,1
Vegetables	35,5	54,3	70,0	70,8	74,2	160	No data	106	105	No data	No data	No data	51,2	66,7	No data	No data
Fruits and berries	No data	11,9	14,1	16,6	No data	120—	No data	91	87	No data	No data	No data	13,1	16,2	No data	No data
Grapes	3,8	4,9	6,5	8,3	No data	130	No data	19	17	15,4	No data	No data	25,8	38,2	53,9	No data
Meat and lard (slaughter weight)	31,0	26,5	34,5	42,0	41,0	90	94	92	98	98	99	33,0	28,8	35,2	42,9	41,4
Milk	185,8	193,0	243,5	293,0	287,0	600	357	353	337	319	317	52,0	54,7	72,3	91,8	90,5
Eggs (pieces)	72,3	69,7	100,5	120,0	124,0	360	201	376	357	376	347	36,0	18,5	28,2	31,9	35,7
Wool	1,2	1,1	1,4	1,7	1,7	4	1,5	0,78	0,75	0,80	0,81	80,0	141,0	186,7	212,5	209,9

* Drawn up by the author on the basis of: *Sel'skoe Khoziaistvo SSSR. Statisticheskii Sbornik*, Gosstatizdat, 1960, pp. 26-27, 31, 38, 328, 329, etc.; *SSSR v Tsifrakh v 1960 Godu. Kratkii Statisticheskii Sbornik*, Gosstatizdat, 1961, pp. 115, 116, 180, 181, 189; *Narodnoe Khoziaistvo SSSR v 1959 Godu. Statisticheskii Ezhegodnik*, Gosstatizdat, 1960, pp. 111, 113, 115, 314, 315, 320, etc.; *Ekonomika Kapitalisticheskikh Stran Posle Vtoroi Mirovoi Voiny. Statisticheskii Sbornik*, Vneshnetorgizdat, 1959, pp. 242, 243, 249, 255, etc.; *Sel'skoe Khoziaistvo Kapitalisticheskikh Stran. (Statisticheskii Stravochnik)*, Sotsekgiz, 1959, pp. 93, 249, 250, *etc.; SSSR-SSHA (Tsifry i Fakty)*, Gospolitizdat, 1961, pp. 69, 71, 74, 75, 78, 79, etc.; *SSHA. Slovar'-Spravochnik*, Gospolitizdat, 1960, pp. 258, 259, etc.; *Agricultural Statistics*, United States Department of Agriculture, 1957, 1959; *Statistical Abstract of the United States*, pp. 162, 165, 169; "Monthly Bulletin of Agricultural Economics and Statistics," Vol. IX, December 1960; *Food and Agriculture Organization of the United Nations*, Rome,

per capita grain production in Russia (on a yearly average) was some 2.5 times lower than in the USA, production of sugar beet was almost 40% higher, raw cotton was almost 20 times lower, potatoes were 1.9 times higher, vegetables, fruit, berries and grapes (according to incomplete data) were much lower, meat and lard were almost three times less, milk was 2 times less, eggs were 3 times less and wool was 20% less than in the USA. It should also be remembered that the rural population in pre-revolutionary Russia accounted for 82% of the total and that 75% of the entire gainfully employed population of the country were employed in agriculture. Hence the low level of per capita output also indicates the exceptionally low level of agricultural labor productivity in pre-revolutionary Russia. In the USA agriculture was highly developed even before World War I and the per capita output of the more valuable farm products was high.

As the figures given in Table 1 indicate, agriculture in Russia prior to the Great October Socialist Revolution was many decades behind the USA and a number of other capitalist countries in the level and intensity of its development.

Up to 1953 the elimination of the gap between Soviet agriculture and US agriculture proceeded slowly, at a low rate. During this period per capita production of a number of the most important products in this country, far from growing, actually declined (grain, flax fiber, meat and lard, eggs and wool). The entire agricultural output of our country between 1913 and 1953, according to figures published by the USSR Central Statistical Administration, increased by a total of 46% (in comparable prices), and per capita production grew even less since the total population of the country grew during the period by 20% (within the present boundaries of the USSR). In the USA, where the growth of rural population during these years exceeded that in the USSR, per capita agricultural output remained high, although for a number of products it also declined (grain, raw cotton, potatoes, meat, milk, wool).

However, in comparing the above data it should be remembered that agriculture developed in the USSR and the USA during this period under totally different conditions. In the USSR the conditions for the development of agriculture were exceedingly difficult for many years, while in the USA they were exceptionally favorable. During World War I, the Civil War and the foreign military intervention on agriculture suffered enormous damage. Suffice it to say that the gross output of agriculture in 1917 amounted to 88% and in 1921 to only 60% of the 19 level. The resistance of the kulaks during the years of complete collectivization also greatly retarded the development of agriculture. During this period the livestock in the USSR, as compared with 1928

was reduced as follows: cattle by half; pigs by nearly three times, sheep and goats by more than three times, horses by 2.5 times. Soviet agriculture sustained tremendous losses during the Great Patriotic War and the fascist occupation of part of the territory of the USSR. During these years livestock was again drastically reduced: cattle by more than 13%, pigs by 2.6 times, sheep and goats by nearly 24%, and horses by more than 2 times. The areas under all crops were also hsarply cut: from 150.4 million hectares in 1940 to 113.8 million hectares in 1945. The gross agricultural output of the USSR in 1945 was 39% below that of 1940, the output from land cultivation being reduced by 40% and from animal husandry by 37%.

None of these difficulties were experienced by US agriculture. On the contrary, both the First and Second World Wars were exceptionally favorable periods for its development.

In considering the per capita agricultural output indices for the Soviet period up to 1953 and comparing them with the respective indices in the USA, another point must be remembered. In the USSR this was a period of social and technical reconstruction of agriculture, during which virtually all the social production funds of the collective and state farms were created anew, while in the USA the process continued of expanding and renovating the enormous production funds of agriculture accumulated even before 1913.

After the historic September (1953) Plenum of the CPSU Central Committee, Soviet agriculture was firmly placed on the road of rapid development. Since then agriculture in the USSR has developed at a faster pace than in the USA. Thus during 1954-1960 the average annual rate of agricultural development in the USSR was 6.2% as against only 2.4% in the USA. During 1954-1958 the average annual rate of growth of grain production was 11% in the USSR and only 5.6% in the USA, of meat 6% and about 1.7%, of milk 10% and 0.8%, and of wool 6% and 0%, respectively.

In 1960 agricultural output in the USSR amounted to 121% more than the 1913 level and was 53% higher than in 1953. The total per capita output in 1959 (in comparable prices) was 66.2% higher than in 1913 and 36-40% higher than in 1953. (1)

Production of many products in 1954-1958, compared with the previous five-year period (1949-1953), was considerably higher (on yearly average): grain, vegetables, fruit and berries, grapes, meat, milk and wool — about one-third; sugar beet, flax fiber and sunflowers — more than 1.5 times; eggs — about 1.5 times. In the USA per capita production in practically all types of output declined during these years. This clearly demonstrates the advantages of socialist over capitalist agriculture. As the figures in Table 1 show, our country in 1960 was much less behind the USA in agricultural output than in 1909-1913, and today Soviet agriculture has surpassed US agriculture in a number of important products (sugar beet, potatoes, wool). Some products are produced in the USSR that are not produced at all in the USA (such as flax fiber, etc.).

However the advances made by Soviet agriculture during the past few years are far from sufficient to bridge the gap separating the USSR from the USA in per capita agricultural output. To eliminate this gap it is necessary to substantially increase the rate of growth of agricultural output on the state and collective farms of the country.

Agriculture in the USSR has developed and is still developing at a slower pace than industry. At the same time the urban population, which consumes most of the marketable agricultural output, has greatly increased. The country's gross industrial output between 1913 and 1960 increased nearly 45 times as against, as already indicated above, 2.2 times in agriculture. The average annual rate of growth of industrial output during the 43 years of Soviet power has been 10.1%, and of agricultural output, only 2%. Labor productivity in industry during this period went up 11.4 times, and in socialized agriculture it increased four times. It should also be borne in mind that the industrialization of the Soviet national economy has been (and will continue to be) accompanied by major quantitative and qualitative changes of many economic indices, in particular, changes in the composition of the population, production funds, etc.).

All these changes are directly related to the development of agriculture. Suffice it to say that between 1913 and 1961 the total population of the USSR (within its present boundaries) increased by 57 million, or 35.8%, while the city population increased 3.8 times. The rural population, on the contrary, dropped during this period by nearly 18%, while the proportion of the gainfully employed population in agriculture dropped from 75% in 1913 to 38.8% in 1959.

State capital investments in industry from 1918 to 1960 amounted to 133 billion rubles (in the new prices), or 47.8% of all capital investments in the national economy, and to 23.3 billion rubles, or 8.4%, in agriculture. The basic production funds in industry and construction increased 32.8 times between 1928 and 1959, and in agriculture 2.6 times.

This was due primarily to the fact, pointed out in the decision of the January 1961 Plenum of the CPSU Central Committee, that "during the first period of Soviet power, in the years of the first Five-Year Plans, the Party and the entire Soviet people

directed their efforts primarily towards creating a heavy industry, production of the means of production. The Soviet people economized on everything in order to create in a short period a heavy industry, which is the basis of the entire national economy and of the strengthening of the country's defences." Differences between the rates of development of industry and agriculture were thus inevitable, and were justified in the main in the interests of building communism.

However the big discrepancy between the growth rates of industry and agriculture enters into contradiction with these interests and impedes the steady advance of the people's well-being. At the new stage of historical development — the stage of the extensive building of communist society — it is necessary, as Comrade N. S. Khrushchev pointed out at the January Plenum of the CPSU Central Committee, "that all branches of the national economy develop uniformly, that agriculture does not lag behind in its development, that the production of consumer goods and farm products outstrip the growing demands of the people."

All this, in turn, requires a substantial increase in the per capita production of agricultural products in the USSR as a whole, and in the various economic districts, territories, regions, and republics.

To secure an abundance of agricultural products in the country, to achieve a level of production which will exceed the growing demand of the population, to fully meet the country's demand for agricultural products on the scale indicated in Table 1 (on a per capita basis), and to solve successfully the basic economic task of the USSR, it is necessary to continue rapidly to develop our agriculture, to mobilize all of its internal resources and possibilities, to develop to the utmost the productive forces of agriculture, to improve its scientific organization, to rapidly increase agricultural labor productivity.

The January Plenum of the CPSU Central Committee found it necessary to substantially increase capital investments in agriculture, as well as in industry serving agriculture, over and above the amount foreseen by the Seven-Year Plan. The decision points out that agricultural production must be organized so that each year, no matter what the climatic conditions, regardless of the whims of nature, guaranteed harvests of the crops necessary to the country will be assured. The achievements of science and advanced experience should be applied to agricultural production more resolutely and on a more extensive scale; the supply of agriculture with machinery, fertilizers and chemicals should be improved; the existing system of state purchases of farm products should be reorganized and fundamentally improved, and a number of other measures should be taken to ensure the utmost development of agricultural pr duction in all regions of the country, taking into a count their natural and economic conditions.

In doing so it must be remembered that the in- crease of capital investments in agriculture and t implementation of long-range plans of developme of the agricultural machinery industry, productio of mineral fertilizers, construction of new irriga tion systems and expansion of irrigated and im- proved areas, as well as their economic develop- ment, will require time. However a sharp increa in the output of farm products must be secured in 1961-1962. Hence it is necessary right now for e state farm, collective farm, district, for each in- dustrial enterprise called upon in one degree or a other to serve the needs of agriculture, to direct its forces and means, the entire creative energy the working people towards achieving an increase in output to the maximum degree possible with available resources, techniques and other means production, by perfecting and making fuller and more efficient use of all existing resources. Thi primarily depends upon the work in the local area upon the initiative of the local Party, soviet and agricultural organizations, of the state and collec tive farm people, upon the common effort of all S viet people.

The struggle for a steady advance of agricultur is a paramount condition for the building of comm nist society, the cause of the entire Soviet nation. Meanwhile many regions, territories and republic in 1957-1960 put out only slightly more per capita agricultural produce than in 1954-1956, and in some important lines even less (see Table 2 show on pp. 8 and 9).

The data given in Table 1 show that in the USSR as a whole per capita production in the most important lines of output in 1954-1960 was higher th in the previous periods. At the same time, as the indices given in Table 2 show, a number of regio territories and republics participate only in a ver limited way in the solution of the national task of increasing agricultural output in the country as a whole and in per capita terms. The average annu per capita gross production of grain in 1957-1959 decreased in 36 regions, territories and republic (i.e., in 29.3% of the total) (2), while remaining un changed or increasing only up to 10% in 26 (21.1% of them (the average increase for this group bein 5%). In some areas per capita grain production during this period substantially decreased: by 39 in the Karelian ASSR, 32% in the Komi ASSR, 11% each in the Kirghiz Tajik and Turkmen SSR, 24% Tiumen Region, 13% in Irkutsk Region, 12% in Tomsk Region, 14% in Arkhangelsk Region, and 10 in the Bashkir ASSR. There was also a decrease

(on a yearly average) in the production of grain in the Vologda, Leningrad, Vladimir, Moscow, Orel, Briansk, Kemerovo and some other Regions, and Krasnoyarsk Territory, i.e., in zones of the country with the most diverse natural conditions. Hence this decline in output cannot be explained by the "whims of nature." On the contrary, in all the regions, territories and republics named there are extensive potentialities for increasing the grain crop yields and the output of grain, as was clearly illustrated at the zonal conferences of leading agricultural workers held after the January Plenum of the CPSU Central Committee.

The data on other lines of output is similar to the above data. Only production of sugar beet in most of the sugar-beet areas has substantially increased in per capita terms. Milk production also increased per capita. In recent years there has been a considerable decrease in the per capita production of potatoes and vegetables in many areas of the country. The per capita production of meat and lard during these years dropped in the Komi, Karelian, Chechen-Ingush and Kalmyk Autonomous Republics, in the Murmansk and Arkhangelsk Regions, in the Georgian and Armenian Union Republics.

The reduction in the per capita output of grain, potatoes, vegetables and a number of other important farm products naturally leads to a curtailment of the supply of these products to the population, a heavier demand for these products out of the centralized fund by the areas named, an increase in irrational, long-distance (and sometimes even cross-haul) transportation of products, a lowering of their quality and an increase in production costs. It must be remembered that with the present level of development and distribution of agricultural production the demand of some regions, territories and republics for agricultural products is met only to a small extent from their local production. (3)

Hence the reduction of output in these regions, territories and republics leads to grave consequences.

An analysis of the data on the per capita output of agricultural products of mass consumption by regions, territories and republics in 1954-1959 shows that we have a large number of economic administrative areas (regions, territories, republics) in which the level of local output of these products (on a yearly average) is far below the national and scientifically substantiated consumption norms (see Table shown on page 10).

As the data shows, about 50% of the regions, territories and republics harvest very little grain and potatoes, while nearly 75% of the areas harvest only a small amount of vegetables. Many of the regions, territories and republics produce little meat, milk and eggs. One of the serious causes of this lag, as pointed out at the January Plenum of the CPSU Central Committee and the zonal conferences of leading agricultural workers held in various parts of the country, is the fact that many local Party, soviet and agricultural bodies give insufficient attention to the development of agriculture and its economics.

The heads of individual regions, territories and republics are often content with absolute indices on the growth of agricultural output, sown areas and the number of livestock; they forget that this increase by no means always signifies a per capita increase in agricultural output, since they fail to take into consideration quantitative changes in population.

It is known, for instance, that under Soviet power extensive work has been carried out in Eastern Siberia to increase agricultural output, sown areas and the number of livestock. The farmers of this economic-geographical area have achieved substantial successes. The sown areas in Eastern Siberia (in its present boundaries) increased 4.5 times between 1913 and 1960, the number of pigs on January 1, 1961, was 94.1% greater, and the number of sheep and goats 127.7% greater, than in 1916, etc.

Grain production (the gross harvest on all types of farms) increased from 930,000 tons in 1913 to 4,616,000 tons in 1957-1959 (on yearly average); production of potatoes — from 268,000 to 2,219,000 tons; vegetables — from 75,000 to 312,000 tons; meat and lard (in slaughter weight) — from 122,000 to 255,000 tons; milk — from 918,000 to 1,734,000 tons; eggs — from 152 million to 621 million, and wool — from 4,900 to 15,800 tons. Nevertheless this increase in agricultural output in Eastern Siberia has proved to be insufficient since the population, particularly the urban population, grew rapidly during this period. Between 1913 and 1959 the entire population of this area (in its present boundaries) increased about 2.6 times, the urban population growing 9 times. (4) Hence if we calculate the changes in gross per capita agricultural output and in the marketable per capita agricultural output for the city population, it will be easy to see that the demand for the marketable output in the cities has grown faster than the marketable agricultural output as a whole. Hence, as the corresponding figures show, Eastern Siberia produced per head of population, about 20% less meat and lard in slaughter weight in 1957-1959 (on a yearly average) than in 1913, and 27% less milk. State procurements in Eastern Siberia per head of city population in 1957-1959 (on a yearly average), as compared with the prewar year of 1940, decreased as follows: grain by 23.6%, potatoes by 23.7%, vegetables by 5.7%. State procurements of livestock products per head

Table 2

Per Capita Output of the Most Important Types of Agricultural Products in Various Groups of Regions, Territories and Republics in 1957-1959 (yearly average) Compared with 1954-1956

	Groups								
	I	II	III	IV	V	VI	VII	VIII	IX
	Output declined			Output increased					
	up to 10%	from 10.1 to 20%	from 20.1%	up to 10% or unchanged	from 10.1 to 20%	from 20.1 to 50%	above 50%	Regions which do not produce the given type of output	New regions of production
Grain									
Number of regions, territories and republics	22	9	5	26	29	18	12	2	—
Percentage of total	17.9	7.3	4.1	21.1	23.6	14.6	9.8	1.6	—
Changes in output, on an average for the group (in %)	4.9	13.0	39.0	5.0	14.1	31.2	79.2	—	—
Potatoes									
Number of regions, territories and republics	19	18	5	30	22	23	6	—	—
Percentage of total	15.4	14.6	4.1	24.4	17.9	18.7	4.9	—	—
Changes in output, on an average for the group (in %)	4.7	14.4	33.8	4.4	14.7	30.6	99.8	—	—
Vegetables									
Number of regions, territories and republics	17	14	8	43	16	22	3	—	—
Percentage of total	13.8	11.4	6.5	35.0	13.0	17.9	2.4	—	—
Changes in output, on an average for the group (in %)	5.7	14.4	27.7	4.5	16.3	30.7	81.9	—	—
Sugar beet									
Number of regions, territories and republics	1	—	1	—	—	12	37	69	3
Percentage of total	0.8	—	0.8	—	—	9.8	30.1	56.1	2.4
Changes in output, on an average for the group (in %)	3.2	—	100.0	—	—	36.6	121.1	—	—
Sunflower seeds (grain)									
Number of regions, territories and republics	5	4	23	17	3	9	4	56	2
Percentage of total	4.1	3.3	18.7	13.8	2.4	7.3	3.3	45.5	1.6
Changes in output, on an average for the group (in %)	4.7	15.5	54.7	8.3	17.5	34.2	66.8	—	—

	Groups								
	I	II	III	IV	V	VI	VII	VIII	IX
	Output declined			Output increased					
	up to 10%	from 10.1 to 20%	from 20.1%	up to 10% or unchanged	from 10.1 to 20%	from 20.1 to 50%	above 50%	Regions which do not produce the given type of output	New regions of production
Flax fiber									
Number of regions, territories and republics	6	—	7	5	2	9	7	86	1
Percentage of total	4.9	—	5.7	4.1	1.6	7.3	5.7	69.9	0.8
Changes in output, on an average for the group (in %)	4.1	—	38.9	6.6	12.9	36.4	107.7	—	—
Raw cotton									
Number of regions, territories and republics	1	—	8	1	4	—	—	109	—
Percentage of total	0.8	—	6.5	0.8	3.3	—	—	88.6	—
Changes in output, on an average for the group (in %)	3.0	—	90.0	1.8	12.1	—	—	—	—
Meat and Lard (in slaughter weight)									
Number of regions, territories and republics	10	1	4	25	28	53	2	—	—
Percentage of total	8.1	0.8	3.3	20.3	22.8	43.1	1.6	—	—
Changes in output, on an average for the group (in %)	4.6	20.0	31.5	4.8	15.9	36.6	54.6	—	—
Milk									
Number of regions, territories and republics	1	1	2	9	9	97	4	—	—
Percentage of total	0.8	0.8	1.6	7.3	7.3	78.9	3.3	—	—
Changes in output, on an average for the group (in %)	5.4	11.5	24.0	7.2	15.4	33.1	52.9	—	—
Eggs									
Number of regions, territories and republics	8	3	3	15	31	53	10	—	—
Percentage of total	6.5	2.4	2.4	12.2	25.2	43.2	8.1	—	—
Changes in output, on an average for the group (in %)	4.5	13.0	41.9	4.5	14.9	31.8	82.1	—	—
Wool									
Number of regions, territories and republics	9	5	3	31	25	36	12	2	—
Percentage of total	7.3	4.1	2.4	25.2	20.3	29.3	9.8	1.6	—
Changes in output, on an average for the group (in %)	4.8	12.2	28.9	4.6	15.3	30.1	59.5	—	—

Table 3

Gross Production of Grain, Potatoes, Vegetables, Meat, Milk and Eggs on a Per Capita Basis (For All Categories of Economies As a Whole) in 1954-1959 (Yearly Average), by Groups, Regions, Territories and Republics

Groups of regions, territories and republics	Average per group (in kg.)	Number of regions, territories and republics	Number of regions, territorie and republics (in % of total)
Not producing grain	—	2	1.5
Producing grain:			
up to 100 kg.	40.6	19	14.1
100.1-200 kg.	161.5	13	9.6
200.1-500 kg.	332.6	41	30.4
500.1-1,000 kg.	720.7	36	26.6
above 1,000 kg.	1,950.0	24	17.8
Total	—	135	100.0
Producing potatoes:			
up to 100 kg.	50.7	29	22.7
100.1-250 kg.	167.9	30	23.4
250.1-500 kg.	397.6	22	17.2
500.1-750 kg.	590.2	19	14.9
750.1-1,000 kg.	856.6	14	10.9
above 1,000 kg.	1,198.0	14	10.9
Total	—	128	100.0
Producing vegetables:			
up to 50 kg.	35.4	44	34.4
50.1-75 kg.	60.9	34	26.5
75.1-100 kg.	86.1	29	22.7
100.1-125 kg.	110.1	16	12.5
125.1-150 kg.	133.8	4	3.1
above 150 kg.	166.0	1	0.8
Total	—	128	100.0
Producing meat and lard of all kinds (slaughter weight)			
up to 10 kg.	8.3	4	2.9
10.1-20 kg.	16.5	19	14.1
20.1-30 kg.	26.2	22	16.3
30.1-40 kg.	35.6	27	20.0
40.1-50 kg.	46.3	29	21.5
above 50 kg.	58.8	34	25.2
Total	—	135	100.0
Producing milk of all kinds:			
up to 100 kg.	76.8	14	10.4
100.1-200 kg.	154.0	30	22.2
200.1-300 kg.	258.2	39	28.9
300.1-400 kg.	348.3	33	24.4
400.1-500 kg.	437.3	15	11.1
above 500 kg.	544.5	4	3.0
Total	—	135	100.0
Producing eggs:			
up to 50 pieces	28.4	17	12.6
50.1-100 pieces	77.0	50	37.0
100.1-150 pieces	120.6	46	34.1
150.1-200 pieces	169.6	18	13.3
200.1-250 pieces	228.5	2	1.5
above 250 pieces	262.5	2	1.5
Total	—	135	100.0

f city population were larger in recent years than efore the Great Patriotic War, but their absolute olume was far behind the demand. In 1957-1959 tate procurements in Eastern Siberia (on a yearly verage) per head of city population amounted to: attle and poultry in live weight, less than 60 kg.; eat and lard in slaughter weight, about 30 kg.; milk, 70 kg.; and eggs, 22 pieces.

Underestimation of economic analysis of the results of agricultural output has frequently been due the fact that little attention has been given to agriculture in the total economic activities of the economic administrative areas. Unfortunately the needs nd interests of agriculture are sometimes ignored the determination of the development and exploitaon prospects of the new regions of the country, parcularly the eastern regions. The numerous organiations engaged in industrial and town planning, the lanning and other bodies concerned with the economc development of new regions and construction of reat hydro-electric and thermal electric power staons, industrial enterprises, new cities, industrial enters, etc., often fail to pay attention to the need r a corresponding development of agricultural prouction, which must supply the city population with s food, and the light and food industries of these ities and centers with their raw materials. In the rojects and plans for economic development of the egions, construction of new industrial centers, ities, enterprises, transport facilities, etc., capital nvestments are not generally provided to set up the ecessary new agricultural enterprises and develop e existing ones. No projects and title lists are rawn up for the establishment of new state farms, xpansion of state and collective farm production nd its reorganization (changes in specialization, in evel of intensity, technical equipment, electrificaon, etc.). The State Institute for City Planning and e other institutions engaged in planning the new egions at best work out "general considerations" n the development of agriculture and make calculaons of the amount of agricultural produce required meet the needs of the city population. However ll these calculations are not concrete and are dective.

In the planning of the national economy as a whole, e importance of a rapid development of agriculture s also underestimated. At the present time branch lanning for regions, territories and republics is redominant, and composite, general, territorial regional) planning is not being done sufficiently. his frequently leads to the irrational solution of any problems, waste of social labor and incomplete se of existing opportunities for the further developent of social production, particularly in agricul-ure. Thus in regions and territories the agricultural development plans are being prepared by the regional and territorial executive committees, independently, as a rule, of the plans drawn up by the economic councils for industry, city (communal) economy, construction, etc. The interrelation of the interests of industry, municipal economy and agriculture is often ignored or underestimated. As a result, the cities, for instance, spend large sums on special purifying and sewage installations, the burning of human waste, etc., while this water, sewage, waste and some other industrial and municipal waste matter (warm water, used steam, etc.) could be usefully applied in agriculture. Many valuable agricultural products could be produced through the use of this waste.

Naturally such planning practice often leads to serious disproportions in the rate and scale of industrial and agricultural development in many regions, to great difficulties in supplying the cities and new industrial centers with agricultural products, particularly with fresh milk, vegetables and potatoes, fresh meat and eggs, etc.

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At the January Plenum of the CPSU Central Committee and the zonal conferences of leading agricultural workers held between January and March, emphasis was frequently placed on the need for proportional development of all branches of the national economy and the utmost increase of the growth rate of agricultural production. It was shown that extensive reserves for increasing the volume and speeding up of the rate of agricultural output exist in various zones and regions.

In order to achieve the task set by the January Plenum of the CPSU Central Committee of increasing agricultural output in amounts always in excess of demand, it is necessary, in the center and especially in the local areas to give more attention to the development of agriculture, to the study of agricultural economics and the state and collective farms.

At the present time the closest attention must be given to studying the economics of a substantiated and most effective distribution of agricultural production and its specialization in the country as a whole and in the various economic administrative regions, to the questions involving the material interest of the collective farmers and state farm workers in the development of the social economy, the problems of higher labor productivity and lower production costs, the organization of stable land holdings of a rational size by the state and collective farms, the proper economic organization of their holdings, the establishment of an economically effective and scientifically substantiated structure of land holdings and sown areas, the determination

of the size and effectiveness of capital investments in agriculture (taking into account the time factor), the peculiar features of agriculture in the country as a whole and in the various regions, and other important questions.

The solution of each of these economic and organizational problems requires the simultaneous consideration of many problems of the scientific organization of agricultural production applicable to local natural and economic conditions, the generalization and successful application of advanced experience, the organic coordination of agricultural development with the growth of all other branches of the national economy in each area. For these problems to be successfully solved it is necessary to have corresponding balance calculations based on such an index as per capita gross and net agricultural output, including many types of marketable products (particularly potatoes, vegetables, fresh milk, meat, etc.), in terms of per capita city population.

A study of the problems of agricultural economics and an economic analysis of the results achieved should be made in each economic administration region. This is all the more necessary since the near future will see extensive measures taken for the further development of new lands (8 million hectares), the setting up of regions of intensive farming on irrigated and improved lands, the establishment of many hundreds of new, specialized dairy, vegetable-potato — and other state farms near big cities and industrial centers. The years will see a further development of electrification and mechanization of agriculture, an extension of the old and the creation of new industrial capacities supplying agriculture with machinery, mineral fertilizers and other means of production, as well as consumers goods.

A comprehensive and thorough economic analysis of the data on the production and distribution of the most important agricultural products in per capita terms will undoubtedly promote (as applied to the concrete conditions of the various regions) the most correct solution of all these problems. Such an economic analysis should be carried out as as a matter of duty by all the planning commissions of the regional and territorial executive committees of the Soviets of Working People's Deputies and the republic state planning commissions. An economic analysis of the data on per capita production and consumption of the most important agricultural products, including the marketable products procured by the state per capita of city population, will inevitably require that the local leading Party and soviet bodies supply an answer to the question of how and at whose expense must the growing demand for agricultural products be met, whether through a more rapid development of agricultural production locally or through the import of products from other parts o the country. Faced with this question the local lea ing Party and soviet bodies will approach more thoughtfully the practical solution of all the above mentioned problems in the interests of the nationa economy as a whole; this will also help to elimina the inclination to depend on outside aid. In many cases it will be difficult or impossible to prove th necessity and economic expedience of meeting the growing demand for agricultural mass consumptio products by importing them from other regions. The data given in Table 2 on the grouping of the r gions, territories and republics by per capita pro duction of agricultural products shows that at the present time in only a few areas does the gross ou put of agriculture per head of population exceed th level necessary for full satisfaction, according to scientifically substantiated norms, of the consump tion needs of their populations. Besides, the area with high per capita production indices are usuall situated many hundreds, even thousands, of kilometers away from the regions, territories and re publics experiencing a particularly sharp shortag of mass consumption products (milk, potatoes, vegetables, meat, etc.) of local production. Thus the problem of the maximum increase of agricultural production of mass consumption products on a per capita basis is a very pressing national pro lem. Its successful solution largely depends not only on improved agricultural management and th fullest use of the internal resources of agricultur advanced experience, etc., but also on the volume of capital investments which can and should be assigned for the further development of agriculture, for its further intensification and technical equipment, for a more rapid growth of the basic production funds in agriculture, its mechanizatio and electrification, its increased application of chemistry. Implementation of measures necessar to secure this aim will require some time and intensive efforts not only from the workers in agriculture but from the entire Soviet people. Howev this task can and must be solved as soon as possi ble.

Footnotes

(1) Based on data from the statistical yearbook Narodnoe Khoziaistvo SSSR v 1959 Godu, p. 308.

(2) We did not possess official data for some o the union republics by individual regions, and in these cases we used the data for the republic as a whole. For this reason the number of regions covered (123) is less than the number established in the administrative-territorial division of the USSR.

(3) See our article in the Voprosy Ekonomiki, 959, No. 12.

(4) The data on the East Siberian population in 913 was calculated on the basis of figures from Statisticheskii Ezhegodnik na 1913 God (St. Petersburg: 1913), p. 6; Statisticheskii Ezhegodnik na 1914 God (St. Petersburg: 1914), p. 6.

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L. GRUSHETSKII

A Method of Basing Adjustments in Purchase Prices for Grain on Yields (1)

Grain purchase prices now in effect were set on he basis of average yields and costs of production n various zones over several years. In drought reas of the country, however, crop yields substanially diverge from the average yield over several ears depending on conditions. In this situation unlterable purchase prices would make it possible for ollective farms to get unjustifiably high incomes in igh-yield years, which would lessen the stimulating ffect of prices on raising labor productivity and owering production costs. In years of poor harvests uch purchase prices may lead to serious financial ifficulties for the collective farms.

By introducing a new principle of price formation or collective farm produce — the principle of adstable and stable purchase prices — the intention s to remove the influence of the weather on the conomics of collective farm output. Adjustment of urchase prices in accordance with crop yields is he way of indirectly redistributing a part of net inome among the collective farms in the country's arious zones and the government.

Altering the level of state purchase prices in acordance with yields requires a correct economic ubstantiation. The chief methodological questions nvolved in an economic substantiation of a change n the level of state purchase prices are: correct etermination of the possible cost of production of a entner of grain in accordance with the crop yield, ased on study of the actual cost at different yield evels and comparison of it with the normative cost; nalysis of the existing grain purchase prices and their relation to prices of animal products and other farm produce which account for a considerable proportion of total agricultural output in the zone; and study of the profitability of grain production by collective farms in the zone under the average yield over several years and establishment of the most rational amount of accumulation in the purchase price for grain in accordance with the change in the yield.

Actual cost cannot be a sufficient basis for price formation unless it is first analyzed critically, since it is often created where there are serious defects in the use of machinery, the outlay of materials and labor, the organization of production, the level of specialization, and so on.

A scientifically substantiated level of production costs, in which account is taken of the existing techniques for cultivating agricultural crops, the degree of mechanization, the conditions, the specialization of production, the materials consumed, the outlay of labor and payment for it on the level of the wages received by workers employed on state farms in the particular area, can serve as an objective index of costs per unit of output.

Normative calculations of cost should be based on scientifically substantiated farming methods of the respective kinds of produce and data on yields covering several years. Production costs determined in this way may be taken as socially necessary costs for a certain period of time and should be compensated for in the purchase price. But this makes it possible to substantiate only stable (base) prices; adjustable prices must be set in accordance with the actual yield and the expected cost of a centner of produce in the particular agricultural year. The higher the yield the lower the outlays per

(1) The author is a staff member of the All-Union cientific Research Institute for Agricultural Eco-omics.

unit of produce. Moreover even if the rise in the yield entails some increase in the outlay per unit of crop, the cost per unit of production is reduced.

The lower cost of grain production in accordance with the level of yield can be illustrated by a classification of collective and state farms in Novosibirsk Region for 1958 (Table 1).

Table 1

Yields of grain (centners per hectare)	Including:									
	All collective farms		Kulunda Zone		Barabinskaia Zone		Eastern Zone		State farms of Kulunda Zone	
	Number of collective farms	Cost per centner (in rubles)	Number of collective farms	Cost per centner (in rubles)	Number of collective farms	Cost per centner (in rubles)	Number of collective farms	Cost per centner (in rubles)	Number of state farms	Cost per centner (in rubles)
Up to 5	7	107	—	—	7	107	—	—	2	82
5.1-6	40	60	1	53	35	55	4	100	1	57
6.1-7	41	46	2	51	32	46	7	46	3	43
7.1-8	64	45	9	33	34	41	21	46	4	37
8.1-9	70	37	10	32	41	31	19	43	1	35
9.1-10	61	33	18	31	23	31	20	37	3	31
10.1-11	50	33	12	31	14	36	24	33	4	29
11.1-12	23	32	11	30	5	31	7	41	—	—
12.1-13	20	29	8	27	4	34	8	25	1	24
13.1-14	6	28	—	—	—	—	6	28	—	—
14.1-15	6	23	3	28	—	—	3	28	—	—
15.1 and over	1	24	1	24	—	—	—	—	—	—

It should be stated that while the cost per centner of grain sharply fluctuates in accordance with the yield, the outlays per hectare sown remain relatively unchanged. Such tasks in grain cultivation as the preparation and transportation of the seeds for sowing, autumn plowing, cultivation of the soil immediately before sowing, the actual sowing and care of the crop, as a rule are necessary under all conditions and the outlays on these tasks are comparatively constant. Change in the outlays in accordance with the yield is determined by production expenses on harvesting, transporting, cleaning and, where necessary, drying the grain. Thus in collective farms of the Novosibirsk Region the average yield of spring wheat in the five-year period 1954 to 1958 was 10 centners per hectare of spring wheat. The costs of the collective farms in the production of wheat at a yield of 10 centners per hectare were taken as a base. The calculation of basic outlays for cultivating a hectare of wheat was made with account taken of the actual production conditions which ha developed in the five-year period. In calculating the basic cost it was taken into account that machine operators were to get 45 rubles for the shift work quota and other collective farmers were to receive the same amount of wages paid state farm workers. The yield of grain and straw was evaluated in accordance with the purchase prices. Outlays on these products were charged in proportion to the cost of the grain to the straw, after first deducting the expense of cleaning and transporting the grain and gathering and stacking the straw.

At the present time, in calculating the productio costs in state and collective farms, seeds are est mated according to the costs of the past year. Th approach leads to mistaken conclusions concernin the profitability of production, since the outlays o several years are confused and therefore the cost does not reflect the outlays of the particular year To avoid such an error seeds must be calculated not at their cost in previous years but at that of th current year. To this end the seeds produced by the farm itself should be excluded from the gross

harvest in figuring the cost. All outlays on the production of the grain are to be charged to gross output less the seeds, in other words, to the net grain harvest. In this case the cost of the plant husbandry produce in a particular crop year can serve as a price formation factor for setting the purchase price.

Data on this divergence of the cost level and defrayal of the outlays on the production of grain in accordance with the cost of the seeds, calculated per hectare sown, is given in Table 2.

Table 2

	Yield (centners per hectare)					
	5	7	9	11	14	16
Outlays per hectare sown, exclusive of cost of seeds (rubles)	233	237	245	257	273	286
Gross output less seeds (centners)	3.3	5.3	7.3	9.3	12.3	15.3
Cost of centner of gross output, including outlays for seed at 32 rubles per centner (rubles)	57.5	42.0	33.3	28.3	23.4	21.3
Reimbursement of production outlays on sale of net grain harvest (rubles)	190	222	243	263	287	320
Cost of 1 centner of net grain harvest, including outlays for seeds at cost of given year (rubles)	70.7	44.7	33.5	27.6	22.2	18.7
Reimbursement for production outlays on sale of net grain harvest (rubles)	233	237	245	257	273	286

The calculations cited show the extent to which production expenses are compensated for by the sale of the gross harvest less the seeds at cost. In the first example the production outlays on spring wheat include the seeds at the cost price of the previous year, which was 32 rubles per centner. The cost arrived at in this way does not reflect the outlays of the particular year because through the cost of the seeds the frequently unequal expenditures of two years are confused. To illustrate, where the harvest comes to 5 centners, the total outlays per hectare, not counting the cost of the seeds, amount to 33 rubles, and the cost of the grain is equal to 57.5 rubles. Sale of the total marketable portion of the crop at cost price will yield 190 rubles, in other words, only 81% of the total outlays, and hence, figured per hectare of crop, there will be a loss of 43 rubles.

In the second example the cost is computed by our method, with seed costs calculated according to costs for the current year. In this instance the cost of a centner of wheat is 70.7 rubles.

The sale of the entire marketable portion of the harvest on the basis of this cost price fully repays all outlays, in other words, the 233 rubles in our example. Thus in adjusting purchase prices it is necessary to take into account a cost level in which the seeds are figures at their cost price in the current year.

Otherwise it would be impossible to set a correct planned price which will compensate for the expenses of a collective farm.

The results obtained by calculating the cost of producing wheat with a yield of 10 centners per hectare taken as a basis on 100 hectares of wheat are given below (see Table 3 shown on the following page).

The cost of production and sale of wheat in an average-crop year is 250 rubles per hectare, and the cost price per centner equals 30.1 rubles.

To determine the profitability of raising wheat and the net income to be derived per hectare sown,

Table 3

	Amount (in rubles)	Structure of outlays (in %)
Remuneration for work (total)	7,530	29
including:		
machine operators	4,320	16
Fuel	3,765	14
Amortization	8,750	33
Fertilizer and toxic chemicals	820	3
Other expenses	2,085	8
Total direct expenses	22,950	87
Overhead expense	3,340	13
Total outlays	26,290	100
including grain, but excluding straw	25,000	95.5

calculated on the base yield, a calculation is made of the distribution of the gross grain harvest and an estimate of its value per hectare sown is drawn up. Since, as we know, grain is less marketable than industrial crops, it is necessary to establish how much grain can be sold through all channels and what its money value will be.

Thus we find that the distribution of grain by the collective farms of the Novosibirsk Region for a five-year period per hectare sown averaged as follows: set aside for seed — 1.7 centners; sold to the government — 7 centners; distributed against workday units — 0.9 centners; and waste products — 0.4 centners. The grain sold to the government and that used for distribution to the collective farmers against workday units were valued at the purchase price paid by the government; waste products were valued at 16 rubles per centner. The cash value of the gross grain harvest (after deducting the seed used) per hectare sown, calculated on the base yield of 10 centners per hectare, was 526 rubles.

The amount of net income of a collective farm per hectare sown and per ruble of production costs shows the economic conditions for growing wheat in collective farms of the Novosibirsk Region at the existing purchase price of 66 rubles per centner. The net income from raising wheat equals 276 rubles per hectare sown.

How net income is distributed between the collective farms and the government within the purchase price structure, calculated per hectare of wheat sown, is shown in Table 4.

Hence income tax and non-refundable insurance payments make up 11.3% of the purchase price structure, and assignments to working capital and indivisible funds 43.1%.

If the purchase price is not adjuted in accordance with the crop yield, the rise in net income per hectare sown in high-yield years would far outstrip the increase in production expenses, and in years of poor crops the production of grain would entail a loss.

Calculations have shown that where the crop yield diverges from the base level a higher net income does not directly depend on the additional production expenses. Thus where there is an increase in the crop yield from 10 to 15 centners per hectare, production expenses rise by only 11%, while the net income is rising by 106%, or 296 rubles. The same has been observed where there is a decrease in the crop yield.

The explanation for this sharp disproportion

Table 4

	Zone purchase price	Cost	Net income	Income assigned for:	
				Income tax and insurance payments to government	Working capital and indivisible funds of the collective farms
Structure of wheat purchase price (rubles)	66	30.1	35.9	7.45	28.45
The same (in %)	100	45.6	54.4	11.30	43.10
Net income per hectare of wheat sown (rubles)	—	—	276.0	61.50	214.50

between the change in production expenses and net income is that the main production outlays in agriculture are relatively stable, depending little on the crop yield, and the money income depends directly on the amount of marketable grain and its cost.

In order that collective farms may earn more uniform incomes and operate according to plan in good and bad crop years, it is necessary to adjust the purchase price by taking into account changes in the yield.

To determine what the purchase price should be in a particular zone, depending on the crop yield, let us examine how a scale for correcting grain purchase prices has been constructed (Table 5). It was constructed on the principle of compensation for outlays for the production and sale of the produce and of provision of the most rational level of production profitability. To illustrate, the purchase price for grain in Novosibirsk Region, should the crop yield exceed 10 centners per hectare, should be fixed so as to cover production outlays and the necessary level of profitability established for the base crop yield. The purchase price drops when the crop yield is higher. However the net income per hectare sown is higher as a result of the increased marketable produce and the lower cost of the grain. At the same time, in low-yield years it would be incorrect to reimburse production outlays and to ensure the profit norm for the base year through the purchase prices. If the norm of profitability of an average-yield year is retained where the crop yield is less, collective farms would receive in a year in which the crop yield was 5 centners per hectare practically the same income as in a year of average yield (10 centners per hectare). This would undermine the incentive to work for higher yields. Therefore it is necessary to set the purchase price for a low-yield year at a level which will compensate for cost accounting production costs and ensure a certain net income.

Table 5*

Yield (centners per hectare)	Gross harvest per hectare sown less seeds (centners per hectare)	Spent for 100 hectares sown (exclusive of cost of seeds)		Cost of gross output (less seeds) estimated in accord with purchase price (rubles)	Possible purchase price per centner (rubles)	Cost of 1 centner		Net income per hectare sown		Amount of net income in purchase price for 1 centner (rubles)
		(rubles)	% of base year			(rubles)	% of base year	(rubles)	% of base year	
5	3.3	23,280	93	29,500	90	71	230	63	23	19
6	4.3	23,510	94	32,900	78	55	180	94	34	23
7	5.3	23,732	95	33,480	66	45	150	98	35	21
8	6.3	24,062	96	44,008	66	38	126	158	58	28
9	7.3	24,560	98	46,140	66	34	111	216	79	32
10	8.3	25,000	100	52,640	66	30	100	275	100	34
11	9.3	25,790	102	54,200	61	28	94	285	104	33
12	10.3	26,360	105	55,500	57	26	87	292	106	30
13	11.3	26,960	107	56,800	52	24	80	299	108	28
14	12.3	27,360	109	58,360	49	22	73	302	110	27
15	13.3	27,910	111	59,460	46	21	70	307	112	24
16	14.3	28,600	114	60,000	43	20	67	314	114	23
17	15.3	28,960	116	61,000	41	19	63	321	117	22
18	16.3	29,400	118	62,000	39	18	60	325	118	21
19	17.3	30,020	120	63,000	37	17	57	330	120	20
20	18.3	30,540	122	64,000	35	16.5	54	335	122	19

* The calculation was made on the basis of the purchase price for spring wheat on collective farms in the Novosibirsk Region. The dotted line underscores the indices within the base yield.

On the basis of the above principles we give in Table 5 a scale of purchase prices for spring wheat adjusted for changes in the crop yield.

Thus, possessing information on the crop yield and making use of the scale we can calculate quickly and fairly accurately the possible purchase price. For example, where the yield of wheat is 15 centners per hectare it is evident from the adjustment scale that the cost of a centner of wheat in the zone will come to 21 rubles and the purchase price per centner can be set at 46 rubles per centner. In this case net income per hectare sown will be 307 rubles, or 32 rubles more than the net income in the base year. At this price all outlays on the production of wheat will be repaid and profitability, set on the basis of the average yield over several years will be ensured.

With an increased crop yield the cost per centner will be lower than that of the base yield as follows: where the yield is 15 centners per hectare the cost will be 30% less, where it is 18 centners per hectare it will be 40% less, and so on. We can therefore conclude that the purchase price can be more than 20% less than the purchase price for the zone which is set on the basis of the average crop yield over several years. Moreover the norm of profitability of growing wheat does not change and the collective farm's net income per hectare sown goes up.

The purchase price for wheat, set for a crop yield of 10 centners per hectare, need not be raised where the yield has dropped to as low as 7 centners. With a yield of between 7 and 10 centners per hectare collective farms will have a sufficiently high profit norm. Where, however, the crop yield is down to 5 centners, an increase of 20% in the purchase price will not be enough to cover production outlays. In such a case the purchase price of a centner of wheat has to be 85 rubles to ensure merely simple reproduction, even though this price is 30% higher than the stable purchase price. To permit setting aside a certain amount of money for the indivisible and working capital funds where the crop yield is only 5 centners per hectare, the purchase price has to be not less than 90 rubles per centner. At that price net income per hectare sown will be 63 rubles, of which 34 will go into the government budget and 29 to the collective farm's funds. In adjusting purchase prices for grain in a low-yield agricultural year, the yield in the preceding years has to be taken into account since it determines to a certain extent the distribution of the produce the collective farms already have on hand, and the stocks of food, fodder and seed set aside to ensure against emergencies.

The method proposed here for making up an adjustment for purchase prices to accord with crop yields will be useful only if the conditions for production in the particular zone are taken into account.

Footnote

(1) The article was written in order to stimulate discussion of the problem (L. G.).

Vestnik Moskovskogo Universiteta, Seriia Ekonomiki, 1960, No.

V. S. MIKHEEVA

On the Economic Appraisal of Agricultural Land

Much has been written on the question of the economic appraisal of agricultural land. It is very important both from a theoretical and the practical point of view to solve this problem successfully, since the economic value of land lies at the basis of income tax calculation and the establishment of price zones.

In recent years researches have focused their attention on a search for generalized economic indices with which it would be possible to compare the value of lands differing in their national properties, established methods of farming, available transportation facilities and distance from market.

It would be difficult to enumerate all the indices that have been suggested by the authors of the numerous studies. Therefore we will mention here

only those which are encountered most frequently in our press and which were most discussed at the scientific conference on calculating agricultural land area and appraising its quality, held in the Geography Department of Moscow University from March 21 through March 25, 1960.

Let us deal first with those indices for land appraisal with which it is hard to agree, namely, evaluation of agricultural land by yield, produced value, gross harvest, and gross and net income per unit area. (1)

All these indices can serve only as illustrations of separate aspects of agricultural production, but neither each individually nor all taken together can be a criterion of the economic appraisal of agricultural land, since they do not take into account production costs.

The net income per unit of land area can be such an index only in the exceptional case of equivalent outlays for the different plots of land. (2) When the outlays are not equal one cannot operate with the net income index.

We offer the following example.

Plot of Land	Gross Income	Outlays Outlays	Net Income
I	1,000	700	300
II	1,200	900	300
III	1,500	1,200	300

If the plots are compared in terms of net income it must be recognized that they are all equal, but if they are compared in terms of gross income, it turns out that the first is the worst and the third is the best.

To verify this, we make use of the ratio of gross income to outlays:

$$\frac{1000}{700} = 1.43 \qquad \frac{1200}{900} = 1.33 \qquad \frac{1500}{1200} = 1.25;$$

or the ratio of net income to outlays:

$$\frac{300}{700} = 0.43 \qquad \frac{300}{900} = 0.33 \qquad \frac{300}{1200} = 0.25.$$

The results obtained reveal the opposite, namely, that the first plot is the best and the third is the worst. From this the conclusion may be drawn that no data pertaining to the volume of output can be used for an economic appraisal of agricultural land if it is not correlated with outlays.

In many geographical studies a characterization of the favorable and unfavorable aspects of the natural conditions in which one or another type of agricultural production is carried on is regarded as an economic appraisal of the agricultural lands. But as a matter of fact this is only an appraisal of the land as a natural body.

An economic appraisal of agricultural land is an evaluation of land as a means of production, and consequently as an instrument of labor in agriculture.

Therefore one must agree with those authors who regard the ratio of production costs to magnitude of output as a criterion for the economic appraisal of land. (3)

The cost price of one centner of output is used as this index most frequently.

Agriculture is essentially a complex enterprise and each economic unit (collective farm, state farm) produces on its land several kinds of grain crops, vegetables, feed root crops and others.

If we take the data for only the principal crops, we will have 15 to 20 series of cost prices. And if we assume that the research is being carried out for 1 region only, which has, say, 30 administrative districts, we will already have to analyze not 15 to 20 series of cost prices but 500 to 600. Within each series there can be numerous diverse combinations. One district will have a low cost price for flax and potatoes, another, for grain and vegetables. But it is impossible to tell which of them has the best agricultural land by using the index consisting of the cost price of one centner of concrete output. This index can be used as an appraisal of what crop should be cultivated and where, i.e., in plant geography.

In order to use this index for an economic appraisal of agricultural lands it is necessary to convert the entire diverse agricultural output obtained from a definite territory to one centner of the overall product, expressed in protein, fodder, grain or value units.

It is doubtful whether there is a satisfactory natural conversion unit which could be applied with equal success to fruit, flax and grain.

If we make use of the value conversion unit, the cost price is the ratio of outlay to the product obtained in money terms.

Let us return to the example given above.

With respect to the ratio of gross income to outlay, the plots of land fit into the series 1.43, 1.33, and 1.25, and with respect to the ratio of net income to outlay, into the series 0.34, 0.33, and 0.25. There may be very many such plots of land and, with respect to the ratio of income to outlay, they all form a definite appraisal series.

In analyzing data it is more expedient to employ the ratio of gross income to outlay, since the denominator (the outlay) enters into the numerator of the fraction, and here the series of ratios undergoes less sharp fluctuations than the series of ratios with respect to net income. The smaller the outlay and the larger the net income the closer these series of ratios become.

Proceeding from the foregoing we drew up a scale of economic appraisal of agricultural land in the districts of the Moscow Region based on data from the annual accounts of collective farms for 1958 (see the table below).

Collective-farm Production Indices for 1958*

Agricultural districts of the Moscow Region	Ratio of the value of gross output of plant husbandry to direct outlays on all plant husbandry production	Ratio of the money (actual) income from plant husbandry to direct outlays on production of the marketable part of the plant husbandry products	Value of the gross product of plant husbandry per 100 hectares of agricultural land (in thousands of rubles)	Direct outlays in plant husbandry per 100 hectares of agricultural land (in thousands of rubles)	% of crops in total sowings				
					grain	potatoes	vegetables	fodder	flax
1	2	3	4	5	6	7	8	9	10
Mesherskii	1.14	1.82	48	38	48	16	4	32	—
Zaoch'e	1.45	1.95	55	38	59	7	2	32	—
Severnyi	1.49	2.20	61	41	38	14	3	42	3
Prigorodnyi	1.58	4.15	149	94	20	21	11	43	—
Zapadnyi	1.63	2.44	61	38	42	9	2	41	6
Iuzhnyi	1.63	2.64	78	51	45	11	4	40	—
Vostochnyi	1.66	3.10	94	56	36	19	7	38	—

* The original article lists the various administrative sub-divisions within each of the above agricultural districts — Editor.

In calculating the estimated number we used the ratio of the value of the gross plant product (in rubles) to direct outlays in this branch of agriculture (in rubles).

In the economic appraisal of agricultural land, use is made of the data on produced values and outlays for plant husbandry only. Included in it are data on the production of all fodder crops. The animal husbandry branch does not enter into these calculations since it is a derivative of fodder production.

In calculating the outlay, all direct outlays on plant husbandry are taken as a whole, including expenditures on seed, fodder, electric motors, workshops (servicing the given branch) and direct outlays on labor at state farm wage rates.

In calculating the value of the gross plant product we made use of the state purchase prices for 1958.

Column 2 of the table, which we call the scale of produced values, shows the index of the economic appraisal of agricultural lands in the districts of the Moscow Region.

According to these indices the agricultural areas of the region fall into three groups: Group I — Meshcherskii, Group II — Zaoch'e and Severnyi; and Group III — Prigorodnyi, Zapadnyi, Iuzhnyi and Vostochnyi.

It is noteworthy that the Prigorodnyi District by no means possesses the best agricultural land in the region and has an appraisal index of 1.58. While producing a gross plant product per 100 hectares of agricultural land that is the highest in value — 149,000 rubles, this district at the same time has the highest outlay per 100 hectares — 94,000 rubles.

There is no cause for surprise that the appraisal index of the scale of produced values does not

undergo sharp deviations from district to district, although they differ in natural, economic and transport conditions.

In the first place the appraisal index is an arithmetical ratio, showing how many times larger or smaller the produced values are than the outlays.

The second point is that the appraisal index has in view the over-all plant product taken in value terms. And if the Zapadnyi District were to stand out for its flax, the Prigorodnyi for its vegetables and the Iuzhnyi for its grain, they would find themselves in a worse position with respect to the development of other branches of plant husbandry. The index gives an appraisal of the productivity of agricultural land as a whole.

A third consideration is that the appraisal index has at its basis the cost output and not its profitability, which may deviate appreciably in different agricultural districts.

What interests us above all are production costs, because we need products that are cheap. That land is good from which more value per unit of outlay is obtained. This economic appraisal of agricultural land in the conditions of a socialist society is economic.

In analyzing agricultural production and comparing individual agricultural districts, it is necessary to show their conditions for sale of their products, since the money (actual) income received has a great influence on the agricultural life of the districts.

For this purpose there has been included in the table, in column 3, an income scale which is the ratio of the money (actual) income in rubles obtained from plant husbandry to direct outlays on production of the marketable portion of the plant product in accordance with state farm wage rates (in rubles).

Upon comparing columns 2 and 3, it can be seen that in the main the income scale for districts repeats the regularities of the scale of produced values, but shows more marked deviations in indices.

These deviations in income for agricultural districts in column 3 are due to transportation conditions and market peculiarities.

Sale of products depends upon market capacity, consumer purchasing power, the number of inhabitants not engaged in agriculture, and the remoteness of the markets from the place of production.

For the Prigorodnyi District the Moscow market can be regarded as a local market, especially if account is taken of the summer season. This district has the largest income in the region, although the products it produces are not cheap and it occupies fourth place in the sale of produced values.

In other agricultural districts of the region part of the produce is inevitably brought to the local, less profitable market, which has a telling effect on income.

The Vostochnyi District, with its own local market consisting of the cities of Orekhovo-Zuevo, Elektrostal', Noginsk and Zhukovski, has better conditions. The Vostochnyi District, which differs noticeably from the Zapadnyi District in income, has nearly the same index as the latter on the scale of produced values.

The differences in appraisal indices on the income scale are also connected with the possibility of profitable sale of a definite product at retail on the collective-farm market. For instance the state purchase price per kilogram is 85 kopeks for wheat, 35 kopeks for cabbage and 1 ruble 80 kopeks for tomatoes, but there is no demand for wheat in retail trade, whereas cabbage and tomatoes may be sold at a price that is higher than the state purchase price. Both appraisal scales — the income scale and the scale of produced values — are of interest in comparing agricultural districts. One appraises the conditions of sale of the produced agricultural products; the other has to do with production and is the scale of the economic appraisal of agricultural land.

The present article does not have as its purpose to show what determines the economic value of agricultural land in the districts of the Moscow Region (the answer to that may be furnished by an analysis of the cost price of one centner of each crop). The cited factual data for Moscow Region only illustrate the scale of economic appraisal of agricultural land.

Footnotes

(1) See Iu. M. Mikhailov, "K. Voprosu ob Ekonomicheskoi Otsenke Sel'skokhoziaistvennoi Zemli," Vestnik Leningradskogo Universiteta, 1959, No. 18; Tezucy Dokladov Hauchnogo Soveshchaniia Po Uchetu i Kachestvennoi Otsenke Sel'skokhoziaistvennykh Zemel' 21-25 Marta 1960 G.

(2) See Karl Marx, Capital, Vol. III, 1955, pp. 662-686 [Russian edition — Editor].

(3) See the theses of the papers by B. L. Gurevich, I. M. Land, V. I. Levshtein and G. R. Romanchenko at the scientific conference on calculating agricultural land area and appraising its quality.

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V. GEL'BRAS AND N. ZARUBOV

On Certain Methodological Questions in Comparing Industrial Labor Productivity in the Socialist Countries

The Labor Research Institute, jointly with a number of related institutes, has not undertaken a comparison of the level of labor productivity in individual branches of industry in the socialist countries. To accomplish this task successfully it is necessary to solve a number of complicated methodological questions.

This article makes an attempt to examine certain basic methodological questions in comparing labor productivity in levels, as well as the experience accumulated in this sphere in Hungary and Czechoslovakia.

Two basic methods for measuring labor productivity levels — the natural and value methods — are used in comparing the labor productivity levels of different countries.

In our opinion it is expedient to use both at the same time. This makes it possible to obtain more precise results.

Employment of the natural method permits determination of the productivity of living labor, while the value method makes it possible to determine the productivity of living labor, the amount of materialized labor economized and the structural changes in production. Therefore the choice of method should be determined by the tasks confronting the researcher.

When natural indices are used, the level of labor productivity in a given branch of production in different countries is measured according to types of output. If there are several of them, the average level of labor productivity in this branch is determined by calculating the indices of the fixed composition. In this case the changes in the structure of production do not affect the results of the calculations.

Employment of the aggregate value indices makes it possible to cover diverse types of production (incomparable types of production). In doing this the indices of the varying composition are calculated, which change along with changes in the structure c production and the relationship of prices.

In comparing the levels of labor productivity in different countries, economists most frequently at tempt to use natural indices, which make it possibl to avoid complicated calculation of price levels an do not admit distortions in calculations caused by differences in price formation.

The natural method, it should be pointed out, is applicable in branches of industry putting out hom geneous produce (the coal, metalurgical, cement an other industries). Here it is necessary to bear in mind the limited number of branches with homogen ous produce. Moreover, in a number of branches labor outlays on repair of equipment is proportionally high and the by-products put out cannot be expressed in units of the basic produce.

Therefore employment of natural indices requires determination of their comparability for the countries concerned. It is necessary to know the methods used in each country in computing the vol ume of production. In the USSR, for instance, it is raw coal that is calculated in tons, in Hungary — sorted coal. If this is not taken into account the volume of production in the given case may deviate by 10 to 15% and more. Furthermore, the same natural indices may cover produce that has gone through different stages of the technological proces For instance the output of fabrics in square or linear meters may mean the output of fabrics that have gone through dyeing and finishing or through dyeing, finishing and manufacturing. And finally th same natural indices may conceal considerable dif ferences in quality and assortment of output.

A number of countries have calculated the comparisons of labor productivity levels with the aid o the natural method.

To compare the levels of labor productivity in th productive branches of various countries it is nec sary to select a sufficiently representative numbe

of branches putting out homogeneous produce, compare the labor productivity level in each of them and then use the results, weighted according to the relative share of wages or the number of workers, to obtain the relative level of labor productivity for the given branch of the productive sector as a whole. Such a comparison of labor productivity levels in the USSR and the leading capitalist countries was made by the Soviet economist A. Katz. (1)

The natural method is applied most frequently in comparing labor productivity in individual branches of industry in various countries.

This method was used by the Institute of Economics of the Hungarian Academy of Sciences to compare labor productivity levels in the industry of the socialist countries. According to Hungarian economist Zoltan Romah, this comparison was made for 1955 for seven branches of industry in the USSR and Hungary and ten branches of industry in Hungary and Poland. (2) Hungary's figure was 30.7% of the Soviet Union's and 29.1% of Poland's.

The calculations were arrived at on the basis of the average annual output per worker. To compare labor productivity levels for an entire branch — for instance, ferrous metal (comparison here affected the smelting of pig iron, open-hearth steel and the production of rolled iron) — researchers took the weighted geometric mean, with the weights based on the number of workers in the USSR and Hungary. The result was that in 1955 labor productivity in the Soviet Union was almost seven times that in Hungary in the case of pig iron, 2.6 times in the case of open-hearth steel and 2.95 times in the case of rolled iron. For the ferrous metals as a whole the Soviet level was more than 3.45 times that of Hungary.

An analysis of the labor productivity levels in the three countries is given in the following table.

By extending the data received to all industry, Hungarian economists came to the conclusion that in 1955 labor productivity in Soviet industry was on average approximately twice that of Hungary. Labor productivity in Hungary and Poland was approximately the same in spite of substantial differences in certain branches of industry.

But since the comparison effected was relatively not very representative, and also because of the conjectural assessment of the comparability of the data used, Zoltan Roman regards the results obtained as an approximation with primarily methodological significance.

The application of the labor method, as a rule, likewise presupposes comparison of labor productivity levels in branches of industry putting out homogeneous produce. In certain cases this method is successfully employed for comparing the levels of labor productivity in branches producing a large number of items. In the USSR, for instance, K. Kuznetsova and E. Sergeeva used it to compare Soviet and US labor productivity levels in the machine-tool building branch. (3)

Labor Productivity in Various Branches of Industry in the USSR, Poland and Hungary in 1955

Branch of Industry	USSR in % of Hungary	USSR in % of Poland
Coal	182	263
Ferrous metals	345	149
Electric power	400	370
Cement	128	118
Woodworking	—	79
Woolens	179	84
Cotton fabrics	169	91
Silk fabrics	102	88
Footwear	—	100
Sugar	—	118
Tobacco	—	79
Beer	—	60

However employment of this method is rendered difficult by the unsatisfactory condition of rate setting in the enterprises, but chiefly by the absence of complete figures on the outlay of living labor and the difficulties in calculating how much working time is actually expended in various countries.

Comparison of labor productivity levels with the aid of the value method requires assessment of produce in two or several countries on the basis of uniform prices. In this case one has to use the constant wholesale prices of the enterprises of one or several countries, the mean arithmetical prices of two countries, world prices, etc. More correct, as many Soviet and foreign economists point out, is calculation of the special coefficients of prices for each of the branches under study.

Calculation on the basis of gross or marketable production presents difficulties because of the complexity of calculating differences in the structure of production, the extent of specialization and cooperation, etc. Moreover in this case it is necessary that production costs and the value of output apply to the same branches, that the concept "branch of production" or "branch of industry" have the same connotation, that the value of output include the same elements, that there be no differences in calculating working time or the number of workers, etc. It should also be borne in mind that both gross and marketable output do not satisfactorily reflect the dynamics of labor productivity.

There are a number of reasons for this: instability of so-called material element in production; mobility of the organizational and technical structure of enterprises caused by the development of specialization, cooperation and combination; different approaches to fixing the prices of new types of production; changes in the relative share of new types of production; and different evaluations of homogeneous produce at different enterprises.

In applying any of the above-mentioned methods of comparing the levels of labor productivity in different countries it is necessary to ascertain the methods of calculating the number of workers or the outlay of working time and to study the structure of the expenditure of manpower in the production of a given type of produce. As investigations have shown, if differences existing in the statistics concerning the number of workers and the methods of calculating the expenditure of working time are ignored, serious errors will be made in computing the relative level of labor productivity.

Experience reveals that calculation on the basis of net production is justified most when one compares labor productivity levels for the entire national economy of several countries, that is, when one computes the national income. In this case it is of course necessary to establish a single method for computing the national income.

In comparing the labor productivity levels of different countries with the aid of the value method, the task, as a rule, is to compare the productivity of social labor, the productivity of labor in individual branches of the productive sector and the productivity of labor in individual branches of industry.

To characterize the productivity of social labor the index of production of the national income per worker in the productive sphere is suitable. Its change characterizes the dynamics of the productivity of living labor, the economy of materialized labor and the changes in the distribution of the number of workers in the branches of production with a different level of net output per worker.

However to fully characterize the productivity of social labor in the national economy it is necessary to take into account data on the employment of labor resources in the country and the consumption value of the output for society. This is especially important in comparing the productivity of social labor in the socialist and capitalist countries.

There is still another way of comparing the levels of productivity of social labor: employment of a respective list of different types of production cha acterizing the structure of production in several countries. This is the method used, for instance, Czech economists.

As pointed out by Aleksei Balek, in comparing levels of industrial labor productivity in Czechoslovakia and the Federal Republic of Germany, th State Statistical Administration of the Czechoslovakian Socialist Republic used the value method. The comparison made involved a relatively small but, as the author points out, a fully representati list of types of production as far as these two cou tries are concerned. It included coal, electric po er, pig iron, sulphuric acid, artificial fertilizer, molding equipment, lorries, bearings, bricks, foo wear, wool yarn, flour and beer. Unfortunately th article does not say what prices were used in the comparison, nor how the value of these items wa calculated in uniform prices. The calculations re vealed that industrial labor productivity in the Fe eral Republic of Germany was 13% higher than in Czechoslovakia and per worker — 7% higher. (4) The results of the comparison of labor productivi levels in the Soviet Union and the Federal Republi of Germany (5) make it possible to conclude that 1956 Soviet industrial labor productivity per wor was approximately 20% higher than that of Czech slovakia in 1957.

At present, along with the comparison of labor productivity levels in diverse branches of industr there should also be, in our opinion, broader com parison of the level of productivity of social labo and labor productivity in individual branches of t productive sector. This will show, in particular, the influence of the growth and extension of the division of labor among the socialist countries on raising labor productivity and the equalizing of th level of development of these countries.

Footnotes

(1) Sotsialisticheskii Trud, 1959, No. 1, p. 42.

(2) Kezgazdashagi Semle, 1959, No. 9 [Trans- literated from the Russian — Editor].

(3) Vestnik Statistiki, 1960, No. 6, p. 31.

(4) Shtatistikan Semle, 1960, No. 3, p. 283 [Tr literated from the Russian — Editor].

(5) Sotsialisticheskii Trud, 1959, No. 1, p. 52.

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Voprosy Ekonomiki, 1961, No. 7

A. AGANBEGIAN

The Working Day and Communism

The systematic reduction of the working day is an objective economic law of development of socialist society. It is directly linked with the aim of production under socialism, with ensuring "the complete well-being and free rounded development of all members of society." (1) Unrestricted development of personality, manifestation of all of the inclinations and talents of every individual, presupposes reduction of working time. This most important thesis of Marxist political economy was put forth and substantiated in Volume III of Capital, where Marx pointed out that the reduction of the working day is the main prerequisite for ensuring a "real reign of freedom," which is essential for the rounded development of human personality.

The socialist revolution is confronted with an historically established working day in each country. Under capitalism it is determined, on the one hand, by the monopolies' efforts to obtain the maximum amount of surplus value and, on the other, by the working-class struggle for better working conditions. The result of the struggle between these two opposing trends depends on the concrete historical conditions of capitalist development in the given country. Generally speaking, the average working day in the capitalist countries is quite long. It may be recalled that in tsarist Russia the average working day for an adult was 9.9 hours for industry as a whole, 10.1 hours in the ferrous metal and coal industries, and even 10.8 hours in the food industry. In the present-day capitalist world, the working day is shortest in the United States. But even there, if we exclude people working less than four hours a day, the average working day for 90% of factory and office workers comes to about 7.5 hours (45 hours a week). More than nine million people, or about one-fifth of all factory and office workers, are occupied from eight to twelve hours a day (48 to 70 hours a week). (2) As for the leading capitalist countries in Europe, the average working day there comes to 7.5 to 8 hours (45 to 48 hours a week) even when those working part-time are included. There is no legislation in the capitalist countries, the United States included, limiting the duration of the working day or week. The law establishes (and not for all the categories of workers) only the limits of the working day or week (40 hours in the United States) beyond which workers are paid at increased rates.

One of the most important tasks confronting the socialist revolution is to limit by law the working day and to realize measures for its reduction. In Russia the decree on the working day was one of the first legislative acts of Soviet power. In the European People's Democracies the working day is limited to eight hours (7.5 hours in the German Democratic Republic); overtime is also limited — it varies from country to country (from 96 to 180 hours a year). (3)

The basic condition for the reduction of the working day in socialist society is the rise of labor productivity. Under socialism there is a regular connection between the rise of labor productivity and the reduction of the working day. Since the former is rising steadily, the reduction of the working day is a systematic, continuous, rather than temporary, tendency.

But the assumption that the reduction of working time will have no end can hardly be considered well-founded. In our opinion, systematic reduction of working time is a law of the first phase of communism. In a developed communist society, when the working day is reduced to three or four hours, there will hardly be any need for a further reduction. The duration of the working day will probably be established and maintained at some optimal level.

In the USSR and the other socialist countries one can distinguish two qualitatively different stages in the reduction of the working day: 1) outstripping the leading capitalist countries in the length of the working day, that is, establishing the shortest working day and week in the world; 2) transition to the communist working day — three or four hours.

As indicated above, the average working week in the United States (excluding those working up to 24 hours a week) comes to 45 hours, and the arithmetic mean for all those who work comes to about 41 hours in the national economy and to about 40 hours in the non-agricultural sector. Most factory and office workers (the overwhelming majority of those engaged in industry and transport and almost all civil servants) are occupied exactly 40 hours a week. To establish the world's shortest working day and week in the USSR means more than outstripping the United States in the average duration of the working

day whether the latter is calculated for all excepting those not regularly employed or whether it is calculated for all workers. The thing is to reach a point where the working time in every branch of industry and for every category of workers will be shorter than for the corresponding group in the United States. In other words to have the shortest working day and week in the world it will be necessary for people employed in the basic branches to work less than 40 hours a week, for the USSR to have no factory or office workers working 40 or more hours a week. So far we have not achieved this.

After the transition of all Soviet factory and office workers to a six- and seven-hour working day (36- and 41-hour working week) in 1960, the average weighted working week in the national economy amounted to 40.2 hours, and 40.5 hours in industry (considering holidays, it is 39.4 and 39.7 hours respectively). We can say without hesitation that, according to average statistical indices, the working day and week in the Soviet economy are already equal to those in the United States and that the working day is even shorter if we exclude those irregularly employed. (4) Nevertheless we can not yet affirm that the Soviet Union now has the shortest working day in the world, since in a number of major branches, including industry, and in the case of certain categories of working people (civil servants, for instance) the working day is still longer than in the United States. Most of these people will work the same number of hours a week as the corresponding working people in the United States in 1962, when the working week will be reduced to 40 hours in accordance with the decision of the 21st Party Congress. With the introduction of the 30- and 35-hour working week in the 1964 to 1968 period, the USSR will have a shorter working day and week than the United States in all branches and for all the categories of workers. This will finally solve one of the important tasks in the peaceful economic competition of the two systems.

The reduction of working time has fully revealed the advantages of socialism over capitalism. This is shown, in particular, by a comparison of the relative levels of labor productivity and the working day in the socialist and capitalist countries. As present, labor productivity in the Soviet national economy is 2.5 to 3 times below the American level. But the average working week has already reached the level in the United States. Although the task of catching up with the American level of labor productivity will not have been fully achieved by 1964-1965, the working day and week in the Soviet Union will already be considerably shorter than in the United States. With the level of labor productivity the same or even lower, socialism brings more benefits to the working people than capitalism, in particular, more leisure time. The source of these benefits is abolition of exploitation and parasitical consumption by the bourgeoisie, and rational and planned utilization of all the resources at the disposal of the society.

The capitalist yardstick for measuring working time, even the most advanced, cannot serve as a gauge for a society building communism. Having established a shorter working day than the developed capitalist countries, the Soviet people and the Communist Party will continue to systematically reduce the working day and the working week.

The source of the reduction of working day is the rise of labor productivity. This well-known theoretical principle should be concretized. Theoretically and practically it is quite important to establish some quantitative relationships between the level or labor productivity and the extent of working time. Of major interest is the interdependence of the extent of working time and the amount of material wealth produced by one worker. If, for instance, we take output for four hours at 100, then in the same working conditions and the normal level of intensity for the given duration of working time he will produce 15 to 20% more in five hours, 35% more in six hours, 45% more in seven hours, 50% more in eight hours. Further extension of the working day will bring an insignificant increase in output and beyond certain limits of working time the increase in output will stop altogether.

We have cited conditional figures: in different types of work and at different levels of mechanization of labor output for working days of different duration is not the same. But these figures correctly describe the tendency for output to decrease with every hour that the working day is extended, and therefore, on the contrary, per-hour labor productivity shows a tendency to rise as the working day is reduced. This tendency becomes particularly clear in the case of manual and mechanized work. It is related to the increase of the normal intensity of work with a reduction in the working day. In the case of automated, strictly regulated processes, the rhythm of which does not depend on the intensity of work, the relationship between the number of working hours and labor productivity per day is expressed by a direct proportion, in contrast to the hyperbolic relation of these magnitudes in the case of manual or mechanized work. (5)

At present about two-thirds of Soviet workers employed in the branches of material production work are engaged in manual labor, while the overwhelming majority of the others do mechanized work and only 5 to 10% perform automated or other strictly regulated processes. The proportion of the latter is greater than the average for material

production in transport and industry, especially in the metallurgical, chemical and food industries (on the whole, 50% of all industrial workers do manual work, 35 to 40% do mechanized work and 10 to 15% perform strictly regulated processes). In construction the relationship between the number of workers doing manual, mechanized and automated work is less favorable. There are also many people doing manual work in agriculture.

The data cited testify to the large possibilities for increasing per-hour output with the reduction of the working day through a normal increase of labor intensity with the reduction of working hours. This factor played a big part in the transition to the six- and seven-hour working day; (6) it should also be taken into account when introducing the 40-hour working week in 1962 and the 30- and 35-hour week in the 1964 to 1968 period. It will continue to operate with future reductions of the working day, although to a lesser degree.

Despite the increase of labor intensity with the reduction of working hours, the reduction of the working day, if all other conditions remain unchanged, is accompanied by a definite drop in output per worker. It should be noted that each new reduction of the working day by one hour results (under constant technological conditions and production organization) in a still greater decrease in output. This is due to the following reasons. The reduction of the eight-hour working day by one hour means a decrease of working time by 12.5%, in the case of the seven-hour day it is 14%, for the six-hour day — 17%, and for the five-hour day — 20%. Moreover, every time the working day is reduced by one hour, the normal intensity of labor increases relatively less; therefore its growth compensates for an increasingly smaller proportion of reduced working time. Finally, as production is techically improved there is an increase in the number of workers performing automated and continuous, strictly regulated technological processes; hence there is less possibility of compensating for the reduction of working time by raising the speed of work.

Therefore each new reduction of the working day requires increasingly thorough preparations along the lines of creating the technical and organizational conditions which will ensure a sharp rise of labor productivity. The rise of labor productivity must not only compensate for the decrease in working time; it must also ensure a considerable additional increase in the production of material wealth essential for the satisfaction of the growing needs of society.

Here we are confronted with a contradiction: the reduction of the working day at this juncture means that society will receive somewhat less material wealth per worker. The real incomes and consumption of the working people drop somewhat when the working day is reduced in comparison with what they would be, all other conditions being equal, if there were no reduction; yet this reduction of the working day is of benefit to them. Roughly speaking, with the reduction of the working day society foregoes the possibility of increasing the real incomes of the working people for the sake of increasing leisure time. The existence of this contradiction is obvious — there is no other way of explaining why we are not introducing a six- and five-hour working day right now.

This contradiction resolves itself in the process of socialist economic development. The reduction of the working day creates favorable conditions for raising the cultural and technical level of the working people and therefore exerts a retroactive effect on the rise of labor productivity. (7) True, this effect is gradual and naturally compensates only at some later time for the decrease in the rate of growth of labor productivity caused by the reduction of the working day. The relation between the rise of labor productivity and the reduction of the working day is thus two-sided and dialectic in character.

Consideration of the interdependence of labor productivity and the duration of working time leads to the following conclusion: to determine the length of the working day at one or another level of labor productivity it is necessary to compare the drop in the rate of growth of productivity resulting from the reduction of the working day with the advantages accruing to society from the increase in leisure time and the effect which this extension of leisure has on raising the working people's general and technical knowledge. In the concrete conditions of each country this comparison can lead to different results even if the level of labor productivity is the same. It is hardly possible to establish a precise quantitative relationship between the level of labor productivity and the duration of the working day. But there are some common features which can be noted.

The experience of the socialist revolution in various countries shows that the length of the working day in the peaceful conditions of socialist economic development does not exceed eight hours, irrespective of the initial level of labor productivity. The maximum eight-hour duration of the working day is dictated by the necessity of creating normal working conditions and raising the educational level of the working people. Moreover, from the psycho-physiological point of view, eight hours is the rational maximum for the duration of work, since a further increase in the number of working

hours gives a relatively small increase in output.

Another point is that as the socialist states catch up with the chief capitalist countries in the level of labor productivity, the working day will become shorter than under capitalism.

Moreover, as we reach a level of labor productivity which ensures full satisfaction of the population's needs in foodstuffs in accordance with scientifically established norms and in manufactured goods in accordance with rational norms signifying abundance, the length of the working day will have to be established on the basis of scientific labor norms dictated by physiological needs and the daily routine of the roundly developed man of communist society. It will probably be a working day of three or five hours.

It will also be possible to formulate in general terms the demands made on the length of the working day by the development of technology and the educational level of the working people that will be necessary to service it. To work with the aid of machines and mechanisms (to do mechanized labor) most workers will need a seven-year general education and at least one or two years of special education, while those working on automated lines will need a ten-year general education and a three-year special education. To transfer a great mass of workers from manual to mechanized work and then to control of automated processes, the duration of the working day must ensure a general rise in the education and specialized training of the working people. And if the seven-hour working day gives workers sufficient free time to learn to do mechanized work (without stopping work), then to learn automated labor it will be necessary to reduce the working day to six and even five hours.

Under socialism the measures taken to reduce the working day are in themselves a powerful means of improving working conditions. At the same time the reduction of working time is organically linked with a number of other measures for improving working conditions.

First of all, unlike under capitalism where the reduction of the working day as the result of the workers' struggle is accompanied by an increase in the intensity of labor to a level above the socially normal, labor intensity under socialism is maintained at a normal level. Available data show that labor intensity in certain branches for which a comparison has been made is 1.5 to 2 times greater in the USA than in the USSR. The socially-normal level of labor intensity depends on the duration of the working day and is somewhat higher in the case of shorter working days. One important practical task is to find scientific methods of objectively measuring and comparing labor intensity in different kinds of work and to elaborate measures for ensuring a normal level of labor intensity in various branches and various operations. At present this level is regulated by the establishment of norms for servicing and conveyer speeds, by the inclusion of rest time in work quotas, etc. This regulation is mainly empiric in character and is based chiefly on established work traditions in diverse branches. In our view the time has come to work out scientifically the conditions that determine labor intensity, especially in processes with compulsory rhythm, and notably in the textile industry.

The reduction of the working day is closely linked with the question of night shifts. In the future, night shifts will evidently be retained only in those sectors of production where they are indispensable for technical reasons (uninterrupted production, transport, etc.) or where night work is essential for better public services. At present, due to a lack of adequate production capacities, three shifts are operated at textile enterprises, certain sections of engineering plants, etc. One of the tasks connected with the reduction of the working day is the introduction of schedules that would reduce the duration of night work. Of interest in this respect is the experiment in the textile industry, where the transition to a seven-hour working day in 1960 was accompanied by the introduction of a successful schedule that made it possible to reduce considerably work in the night shifts.

Of no little importance is the problem of calculating the duration of working time. It is especially acute in the coal industry. The miner's working day is considered to have begun when he arrives at his place of work, the face for example. The working day thus does not include the time spent on changing clothes, receiving a lamp, descending into the pit and going to where he works, nor does it include the time he spends returning to the surface. Correspondingly his working day ends when he leaves his place of work. This calculation of the duration of the working day puts the face workers and the men engaged in excavation work farther away from the pit in an unequal position with the men doing work underground. The miner spends on an average at least one hour to get to the face and back; and naturally going to his work place also means a certain expenditure of energy. In our opinion the working day of a miner should in the future begin with his descent into the pit and end with his return to the surface. Similar, although less important, questions involving calculation of the duration of the working day exist in other branches of production. It is necessary to work out a methodological approach for determining when the working day should begin and end in all branches of industry.

The reduction of the working day also raises the question of differentiating its duration in accordance with the working conditions. A six-hour working day has now been established for all work undergroud and a six-, five- and four-hour day for work done in harmful conditions; a reduced working day has also been introduced for doctors, teachers, instructors and certain other categories of workers. The shorter the average working day becomes the harder it is to maintain this differentiation, but then the need for it, in our opinion, is diminishing. Nevertheless, with the introduction of an additional day off in the 1964-1968 period the existing differentiation in the duration of the working day will probably, on the whole, remain: workers with a seven-hour day will work 35 hours a week, workers with a six-hour day — 30 hours, and workers with a five-hour day — 25 hours.

There are many questions connected with the wages. Under socialism it is unthinkable that the reduction of the working day should entail a drop in the annual level of wages. The hourly wage should increase in inverse proportion to the decrease in working time.

How is the wage level to be secured in practice when the working day is reduced? In the case of time-workers, engineers, technicians and office employees this is achieved by retaining monthly rates and salaries (hourly rates are proportionally increased). The difficulties arise in the case of remuneration of piece-rate workers. In most branches of industry the possibility exists for undertaking additional organizational and technological measures, improving the organization of labor and speeding up work in order, after the working day has been reduced, to raise labor productivity to such an extent that it will enable workers to produce as much as before and therefore earn as much per month. In such cases the work quotas and rates are not revised when the working day is reduced. However in a number of branches, especially in those with a regulated regime of work, output drops when the working day is reduced, and here it is necessary to cut daily quotas and increase piece-rates in order to retain the existing wage level. This of course is not the best way out.

Experience of the past few years has indicated a better solution for the problem: in many branches of production the reduction of the working day was accompanied by the introduction of new and higher rates. During the period 1954 to 1956 the introduction of new wage conditions in industry and construction, which coincided with the transition to the six- and seven-hour working day, pursued the aim of adjusting wages. As a result the level of monthly wages for industrial and construction workers rose approximately by 11 or 12% along with the reduction of the working day.

In the coming years the necessity will arise periodically of extraordinary increases in rates and salaries, mainly for the low- and medium-paid categories of workers, and in order to improve further the system of wages in connection with technological progress, changes in the organization of production and labor, the rise of the workers' cultural, technical and qualification level, and the growth of their well-being. Between 1963 and 1965 it is planned to increase minimum wages from the 40 to 45 ruble level to 50 to 60 rubles a month and at the same time to somewhat raise the rates and wages of medium-paid workers.

In our opinion it would be expedient in the future to reduce the working day and revise wages at the same time in branches of material production. In industry and construction, for instance, it would be possible simultaneously to introduce the minimum wages of 50 to 60 rubles and a five-day working week in 1964-1965. (8)

The direct aim of reducing the working day is to increase leisure time. "Both for the individual and society, his rounded development, consumption and activity depend on the economy of time." (9) The economy of working time, which finds expression in the reduction of the working day, means more leisure time. The extension of the latter is the main prerequisite for the rounded development of the members of a socialist society: spiritual (habituated to culture and science), social (participation in running the state, fulfillment of social duties) and physical (sports, active recreation). All this is essential in the formation of the man of the future communist society. "Free time," Marx pointed out, "which is both a time of leisure and a time for indulging in loftier activity naturally turns the one who enjoys it into a different man...." (10)

A rise in the working people's cultural, technical and qualification level as a result of an increase in leisure time is a very important factor in additionally raising labor productivity. More than 52 million people, or approximately one-third of the citizens of the USSR (not counting children of preschool age and the aged), studied in 1960-1961. This included training and raising the level of workers and other working people at their place of work and at various courses. The general rise in the working people's knowledge has an enormous and an ever-growing effect, and helps accelerate our country's development toward communism.

In our opinion leisure time — the time for the rounded development of personality — cannot be identified with non-working time, a considerable part of which is spent in going to and from work,

buying goods in stores, working at home (cooking, looking after children, etc.), eating and sleeping. Only that time which remains is leisure time proper, that which is used to rest, study, engage in social activities, attend the theater and movies, read books, indulge in sports, etc.

Thus the amount of leisure time depends not only on the length of the working day, but also on the expenditure of time on house chores, going to work, etc. Surveys of the time budgets of factory and office workers show that leisure time proper constitutes approximately one-fifth to one-third of all non-working time, and it is especially short in the case of women workers with children. Therefore the greatest possibilities for increasing time lie in reducing the time spent on house chores, purchase of goods, travel to and from work, etc. Of decisive importance in this respect is the development of various forms of public services. Here are two examples.

At present factory and office workers satisfy no more than one-fifth of their requirements in food through the system of public catering. The remaining four-fifths are satisfied by food cooked at home (this is preceded by purchasing foodstuffs in stores and at the markets, etc.). According to the surveys of the Labor Research Institute, a Leningrad, Tbilisi or Pavlov-Posad working woman with a family spends almost two hours a day on cooking food and washing dishes and at least a half-hour on buying foodstuffs. All the factory and office workers' families, the estimates indicate, spend no less than 20 billion man-hours a year (based on two hours a day per family) on these activities, and that is equivalent to the average annual outlay of labor by more than ten million workers. This data shows that the full development of the public catering system would provide a colossal increase in leisure time. In the current Seven-Year-Plan period, during which commodity circulation is to increase by approximately 65%, it is planned to more than double the output of public catering enterprises and at the same time to reduce prices. If within the next ten years factory and office workers come to satisfy 50% of their food requirements in public dining rooms that will save about five billion man-hours spent on house chores. To make full use of this reserve for increasing leisure time, it is expedient to reduce further dining room prices so that use of the services of public catering establishments will become unquestionably advantageous.

At present approximately every seventh child of pre-school age goes to kindergarten and every twelfth child to a nursery. The overwhelming majority of children are brought up at home. Thus a big part of non-working time, especially as far as women are concerned, is spent on looking after children. Surveys carried out by the Labor Research Institute show that women workers spend about three hours a day on weekdays for this purpose; other members of the family also spend a good deal of time on caring for children. On the whole, all the office and factory workers' families spend no less than 30 billion man-days a year on looking after children, which is equivalent to the annual average outlay of labor by more than 15 million workers. The fullest expansion of the network of institutions for the public upbringing of children (kindergartens and nurseries, boarding schools, prolonged-day groups, Young Pioneer camps, etc.) will permit a sharp cut in these outlays of time and will increase leisure time considerably.

Although curtailment of a number of activities in non-working time plays a big role in increasing the working people's leisure time, the main source is still the reduction of the working day. Suffice it to say that the leisure time of factory and office workers has increased on average by 350 hours a year, which is equivalent to a 50-day vacation, thanks to measures undertaken between the 20th and the 22nd Party congresses: introduction of the six- and seven-hour working day, reduction of working times on the eve of holidays and days off, reduction of the working day to four and six hours for minors, as well as in many sectors with harmful working conditions, the granting of privileges to students, etc.

Of vast importance at present is the task of rationally utilizing the increasing amount of leisure time (expanding the network of institutions for raising the workers' qualification level, increasing their cultural and technical level, satisfying their spiritual requirements, increasing the number of health institutions, etc.). Rational use of leisure time to a large extent depends on the method of reducing working time. The following methods are possible: reduction of the working day, introduction of additional days off or increasing paid holidays. Hitherto working time has been decreased by reducing the working day to seven and six hours. When the Seven-Year Plan is fulfilled the working week will be reduced by the introduction of another day off, while the length of the working day will remain at six and seven hours. The question that arises is whether it will be necessary in the future to increase the number of days off or reduce working time by cutting the working day down to, say, five and six hours. Here much will depend on the opinion of the physiologists of labor. In our opinion it would be inexpedient to increase the number of days off; it would be better to reduce the working day.

Transition to a five-day working week is a

complicated affair. It will require reorganization of the working schedule, the system for supplying enterprises, the work routine of institutions providing public services, etc. The introduction of the five-day working week in the period 1965-1968 will also be linked with a considerable decrease of working time, which in itself will require the implementation of important organizational and technical measures to maintain the level of monthly labor productivity, measures to preserve the level of wages, primarily of piece-rate workers, etc. The question that arises is whether it would not be better in 1962, when we must switch over to a 40-hour week, to introduce widely a working week of five eight-hour days. This transition would not be as complicated as it will be between 1964 and 1968, since it would not be accompanied by a considerable cut in the amount of working time. At the same this would facilitate the switch-over to a 35-hour working week between 1964 and 1968, a change that will require reducing the working day from eight to seven hours. Available experience shows that the drop in output is less when the working day is reduced than when an additional day off is introduced (it is easier to fulfill a seven-hour quota in six hours than to fulfill a six-day quota in five days of seven hours each).

In our view some disparity has developed between the length of the working day and the duration of vacations. Almost half of the factory and office workers in the USSR (44%) enjoy paid vacations of twelve working days, although the average weighted vacation for all categories of working people comes to about 18 days. The vacation system in the USSR is very much better than, for example, that in the United States, where a part of the working people enjoy no paid vacation at all and many workers (with a brief record of service) enjoy a week's paid vacation. The length of vacations in the USSR will probably increase in the future. It can hardly be considered correct that workers with two days off a week have only 12-day vacations. In the future, in our opinion, working time will be reduced more and more through the extension of vacation time, with the length of the workers' vacations approaching that of the engineers and technicians (usually 24 working days). This will enable the working people to make better use of their increasing amount of leisure time in active recreation.

Scientific personnel (particularly physiologists of labor, doctors, economists and statisticians) have the important task of determining the most effective ways of rationally using non-working time. Recently there has been growing interest in these questions. For instance, after a 25-year interruption there has been a resumption of time budget studies. Future investigations in this sphere, we would think, should be directed at elaborating a balance of the use of time, first in a summary form for groups of the population (singling out families with many children, etc.), and then a differentiated balance showing the distribution of families by time spent (giving the main items of time expenditure). Since data on the utilization of time can be obtained only through sample surveys, it is necessary to perfect the methods of these surveys, in particular, to introduce the method of casual, monetary observation and to elaborate methods of compiling statistical data (co-ordination of sample data with the data of complete surveys — on the duration of the working day, composition of the family, etc.). An important task is to work out scientific norms for the utilization of time (daily routines) by groups of population. The normative method is being used on an increasing scale in investigating living standards, and it should also be employed in this new sphere. It is also necessary to analyze the effectiveness of various measures for curtailing individual activities engaged in during non-working time and to elaborate the best possible complex of such measures. Successful solution of these problems by scientists and practical workers working together will facilitate rapid solution of many important problems involved in the building of communism.

Footnotes

(1) V. I. Lenin, Sochineniia, Vol. VI, p. 37.

(2) Current Population Reports, Series No. 203, p. 57.

(3) See Statisticheskii Sbornik po Voprosam Truda i Zarabotnoi Platy v Evropeiskikh Sotsialisticheskukh Stranakh, Gosplanizdat, 1959, p. 20.

(4) It is correct to compare the duration of the working day in the Soviet Union and the United States without taking into account the irregularly employed because there are no such categories of factory and office workers in the Soviet Union and their number, therefore, can not be used in calculating the average duration of the working day.

(5) Students of labor problems have suggested a series of empirical formulas for determining the dependence of per-hour output on the duration of the working day. One of the simplest has been suggested by Academician S. G. Strumilin. See Problemy Ekonomiki Truda, Gospolitizdat, 1957, pp. 71-72.

(6) When the reduced working day was introduced in the 1956 to 1960 period, an increase in the number of workers to make up for the decrease of working time was planned only for strictly regulated processes. In industry, where working time was

(CONTINUED ON PAGE 63)

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B. SMEKHOV

Measuring the Effectiveness of Capital Investments

In a socialist society the effectiveness of outlays is determined by their influence on the productivity of social labor. This is recognized by all those who participate in the discussion of the problem of the effectiveness of capital investments. (1) But having examined the logic of the arguments presented by many economists we discover that as soon as they deal with concrete methods of calculating the effectiveness of outlays the initial proporition on the effectiveness of outlays under socialism is either completely ignored in their arguments or is artificially tied to the proposed methods of calculation.

For all their diversity the recommended methods of determining economic effectiveness in essence mean an identification of the productivity of social labor with profitability of production. Some economists (for example, I. Malyshev) try to lay a theoretical basis under this identification. In most cases, however, reservations like the following are made: "A precise definition of the economic effect is possible only on the basis of a calculation of value. In view of the fact that such a calculation is not yet made, in determining economic effectiveness it is necessary to use indices of prices and production costs which give an approximate idea of the real economic effect." (2)

But profitability of production is far from always giving even an approximate idea of the economic effect of outlays under socialism, inasmuch as this effect is manifested in the productivity of social labor.

Yet it is possible to measure the effectiveness of outlays with the help of indices which reflect with sufficient accuracy the productivity of social labor. This is the index of the national income per person employed in the productive sector. Data for determining which of the projected variants of capital investments as compared with others (or with the operating fixed capital) ensures a bigger increase of the national income per person employed in the productive sphere are available not only on the scale of the national economy, but also in each project. To make use of this data it is necessary first of all to properly formulate the question of the effectiveness of outlays on the scale of a separate enterprise, a branch and the entire national economy.

1. Formulation of the Question

An exact determination of the economic effectiveness of capital investments under socialism demands calculation of the outlays of social working time for the production of various types of goods, jobs and services. Value cannot serve as a fully reliable measure of the effectiveness of outlays because it is proportional not to the outlay of social working time, but to the outlay of labor reduced to one quality. A reduction of value may deviate from a reduction in the outlay of social working time.

"Productive power," Marx pointed out, "of course is productive power of useful concrete labor and actually determines only the degree of effectiveness of an expedient productive activity during a given period of time." (3)

A reduction of value and a reduction of the outlay of social working time coincide only if "every kind of labor power is regarded as simple labor power." This is how Marx regards labor power throughout his entire study of the subject in Capital. But for the practical purposes of planning such an abstraction from the varying quality of labor is impermissible. Therefore the productivity of living labor is planned and calculated by comparing output not with labor reduced to one quality but with the number of workers or the actual number of days or hours of expended labor. Similarly, measurement of the productivity of social labor demands a comparison of output not with its value but with the social working time expended for the manufacture of this output.

In practice a calculation is made neither of the value of the output, nor of the outlay of social working time. Therefore we have to look for roundabout ways of measuring the productivity of social labor as a criterion of the effectiveness of outlays. And the roundabout ways often lead far away from the goal.

There is no need to examine here the possibility

of calculating the outlay of materialized and living labor, expressed in man-hours (or man-days, and so on). We will merely point out that modern electronic computers make it possible to produce such a calculation on a centralized basis, without enlisting the bookkeeping staff of the enterprise. The means for this is the balance of inter-branch ties which is now being worked out in a number of organizations, including the Economic Research Institute and the Computation Center of the USSR State Economic Council and the USSR Central Statistical Administration. We should suppose that the time is not far distant when we will master a method of calculating (for planned and reviewed periods) the norms for the full outlay of the means of production and working time for the reproduction of various kinds of goods. These will be absolutely real magnitudes, not "pipe-dreams on which you cannot get far in the kingdom of economic necessity" and against which we have been warned by I. Malyshev. (4)

We by no means want to abstract ourselves from the fact that the latest computing methods have not been mastered yet and that therefore we should look for a solution of the problem within the framework of the existing system of calculating labor. But in order to raise the question let us assume that it is possible to obtain data on the outlay of all social working time for the production of a unit of each type of output at a definite stage in the development of the productive forces. The existence of such data, it would seem, removes the obstacles to an exact measurement of the effectiveness of outlays under socialism. Indeed that variant of a project for a factory which secures the least total outlay of social working time necessary for the production of output will be the best.

Nevertheless, even if such data on the outlay of social working time were available, there are still no solutions for the questions on the method of assessing various periods of construction and various capital expenditures per unit of output for determining the optimal variant of capital investments in some or other projects.

It is indisputable that the periods of construction and the capital investments per unit of output should be taken into account when choosing objects of construction. But these are problems which clearly can be deliberately solved only on the basis of calculations for the national economy as a whole.

If the difference in the periods of construction is substantial, the acceleration of turnover of capital investments becomes an independent factor in increasing the rates of reproduction. Therefore in some cases while incurring a loss as a result of less economical production of one type of output it is possible to make a gain as a result of more economical social production as a whole through the faster commissioning of fixed capital. Since the criterion of effectiveness of outlays is the productivity of total social labor, it may turn out that in the given branch it is better to build less economical projects, but commission them in shorter periods so as to raise more rapidly labor productivity in other branches.

Substantiating the need for priority construction of thermal electric power stations (less economical than hydroelectric stations), Comrade N. S. Khrushchev said: "The Relatively higher cost of a kilowatt-hour of electricity generated at thermal power stations will be more than compensated by the growth of labor productivity in all branches of the national economy on the basis of the utmost use of electric power. As a result, far from sustaining losses, we will receive a big economic effect from the accelerated development of thermal power stations." (5)

As for capital investments per unit of output, the extent to which they affect the distribution of capital investments in the national economy, their influence on the productivity of social labor — like the influence of construction periods — can be brought out in inter-branch balances of the long-term plan of development of the entire national economy.

In all cases appraisal of the various periods of construction and capital investments per unit of output demands a commensuration of the relative losses in the given branch in case of building the less economical projects with those gains realized by the entire national economy. But to do this, it is necessary in the first place to determine beforehand the economic effect of different variants of capital investments in each branch. From this follows the independent task of measuring economic effectiveness on the scale of the given branch. The second problem is that different variants of long-term plans obligatory for the entire national economy must be prepared. The continuity of long-term planning plays a big part in improving such calculations.

On the scale of the national economy the main task in determining the effectiveness of capital investments is to measure the influence which different variants of distribution of capital investments (between branches of the economy, between regions) exert on the productivity of social labor, taking into account the periods of construction. In the choice of the optimal variant a number of extra-economic factors are also taken into account.

2. Profitability of Production and the Effectiveness of Capital Investments

A method widely employed in practice is to

commensurate the economic effectiveness of capital investments by comparing the so-called recoupment period of different variants of investments and with a norm established in advance. This method is actually based on none other than a comparison of the different variants for the size of profit.

Let us designate the standard recoupment period as T_n, the capital investments of two variants designed for the production of one and the same volume and composition of annual output as K_1 and K_2, the cost of production of this output of the two variants as C_1 and C_2. If $K_1 > K_2$, then the first variant is more effective than the second:

$$\frac{K_1}{T_n} + C_1 > \frac{K_2}{T_n} + C_2$$

In fact all the specific methods used now for determining the effectiveness of investments are modifications of the formula given above.

K and C are absolutely clear indices. But what is T_n? How is this norm to be determined in advance? Or how are we to determine the inverse magnitude $\frac{1}{T_n}$ which bears the highly-promising name of "normative coefficient of effectiveness?"

In the study on the typical methods of determining the economic effectiveness of capital investments, mentioned above, it is pointed out that "normative coefficients for separate branches at present should be set at not less than 0.15 to 0.3, which corresponds to recoupment periods of not more than 3 to 7 years." (6)

On what is the differentiation of these norms based? It is based on the fact that the recoupment periods actually differ in various branches. The scale of periods for the recoupment of investments in mechanization and automation of production is also "based on a study of actual data of recoupment periods in a large number of enterprises (over 9,000). (7) This serves as a basis for recognizing the correct differentiation of norm T_n. In this V. Krasovskii is perfectly right. But what is the economic content of these norms? Why are the recoupment periods different? How can one determine the necessary changes in them for a future period?

If we do not impart to the coefficients we ourselves have constructed some secret meaning and mystic force, we must recognize that objective limits exist for the maximally permissible normative recoupment periods, namely, the period in which fixed capital is worn out physically or become obsolescent. It follows, in the first place, that in setting normative recoupment periods we must not limit ourselves to an analysis only of the recoupment periods in the past, but should also take account of future rates of technical progress in various branches. This is what the typical methods study has in mind: "Normative coefficients of comparative effectiveness, differentiated by branches, must take into account the structure of capital and the specific features of the given branches, rates of technical progress and attainment of the level of advanced foreign technology." (8) The second point is that the shortcoming of T_n norms is not that they are differentiated, but that they are little differentiated and are average magnitudes. The latest model of a machine, let us say, can give good service for ten years, but we apply to it the average norm, say of five years, demanding that in comparison with the machines used now the reduction of production costs as a whole should exceed not only the actual increase in outlays per unit of output, but the fictitious one obtained by using an average standard T_n. In other cases equipment, deliberately destined for early replacement, proves to be efficient when we apply the average T_n period for this branch. There is no doubt that all this can in a number of cases retard technical progress.

But the main shortcoming of the method of recoupment now applied in practice is that it replaces productivity of social labor as a criterion of the effectiveness of outlays by the profitability of production.

Let us take T_n in its extreme meaning, that is, as the maximally permissible recoupment period, objectively determined by the period in which fixed capital is worn out physically or become obsolescent. Then $\frac{K}{T_n}$ is nothing else but the annual amortization in the part that ensures the compensation of the used up fixed capital. But the cost of production, if calculated correctly, must already include amortization including the compensation of obsolescence). In that case we should exclude from Formula 1 the double count and the recoupment formula acquires the following form: $C_1 < C_2$. And since the volume and composition of output in the compared variants is the same, $C_1 < C_2$ means that the more effective variant of capital investments is the one which ensures greater profitability of the planned production. This is the inner economic meaning of the recoupment formula. It contains nothing else.

This is why, with respect to the given problem — measurement of the effectiveness of capital investments — the divergencies, say, between I. Malyshev and V. Krasovskii (9) are not divergencies in principle. The divergency in principle between economists relates to another problem, namely, how to determine profit in constructing a price. This is a large problem but its solution is not related to the question of measuring the effectiveness

of outlays. After all, a profit arrived at by any method cannot serve as a criterion of the effectiveness of capital investments. This will be recognized immediately if only we strictly adhere to productivity of social labor as the real criterion of effectiveness of outlays in socialist conditions.

Krasovskii is correct when he writes: "The criterion of a rise in the productivity of social labor presupposes recognition of the leading importance of the law of the economy of time." (10) But recognition alone is not enough. Does this recognition constitute the "main demarcation line between positions" with regard to measuring the effectiveness of capital investments? Malyshev also recognizes the leading significance of the economy of time. As regards the effectiveness of capital investments the difference in views consists in something else: what many regard as a shortcoming of the recoupment period method is elevated into an advantage by Malyshev and other supporters of the prices of production.

Malyshev places a sign of equality between a change in the profitability of production and a change in the productivity of social labor. He says outright: "Only the level of profit of the given enterprise, calculated in relation to its productive assets formed as a result of capital investments, can be a measure of effectiveness.... If the investments are really effective, if the technology acquired through these investments raises labor productivity, then the level of profit at the given enterprise in relation to its assets must rise." (11)

Is there an objective connection between profitability of production and the productivity of social labor? Of course there is and, moreover, under any of the proposed methods of price formation. The whole problem is in what kind of a connection it is. Some, Maylshev among them, hold that this is a direct connection, if only the prices are constructed according to the price of production method. Others do not agree with this, but think that a reduction of the recoupment period gives an "approximate idea" of the rise in the productivity of social labor. On closer scrutiny it appears that thereby they recognize the direct connection between labor productivity and the profitability of production.

But in reality this connection is far from direct. Profit of an enterprise depends not only on the productivity of social labor, but also on the system of wages, in particular on the relationship between the growth in wages and the rise in its skill and productivity. The same applies to the entire national economy as well. The relation of the accumulation fund to the compensation and consumption funds — this is, so to speak, profitability on the scale of the entire national economy. In the Second Five-Year Plan, for example, this "profitability" declined, although the productivity of social labor rose sharply. A similar process has taken place in other periods as well.

Frequently the rise in the productivity of social labor brings about a very rapid recoupment of capital investments, raising the profitability of production, which testifies to the effectiveness of the investments. Thus, outlays on virgin land development between 1954 and 1956 were not only recouped by marketable grain alone, but also brought the state over 32 billion rubles (in old money) of net income. This is convincing proof that the virgin land development has raised the productivity of social labor.

Moreover in all cases where both material outlays and outlays on wages for living labor are reduced per unit of output without an increase in the number of workers, both the productivity of social labor and the profitability of production increase simultaneously.

But for practical purposes a solution of the problem of measuring the effectiveness of capital investments is awaited not for obvious cases, but for instances when different indices suggest opposite conclusions about the effectiveness of the compared variants of capital investments.

Let us take an example of such an unclear difference between two variants of construction in the productivity of social labor they yield. Let us assume that there are two projects for building a factory. Calculated for the same volume and composition of output the indices for the two variants are as follows (in millions of rubles):

	First variant	Second variant
Capital investments	125	105
Gross output	120	120
Cost of production	100	98
Profit	20	22

Which of these variants of capital investments is more effective?

According to Formula 1 under any normative recoupment period the second variant appears to be more effective: less capital investments are required and the cost of production is lower. Malyshev will speak even more categorically about the effectiveness of the second variant: in relation to the productive assets profit in the second variant is significantly higher. But as soon as we taken into account the differences between the variants in

the outlay of living labor the superiority of the second variant appears far from obvious.

Indeed, let us assume that under the first variant only 20,000 workers will be needed at the given factory, while under the second variant 23,000 workers are required. Even if we calculate on the basis of profit, taking into account not only the projected factory but the entire national economy, the labor saved will secure additional accumulations which possibly will more than compensate for the difference of two million rubles in profit between the first variant and the second. But the main thing is this: what grounds are there for considering that greater profitability of production means a bigger increase in the productivity of social labor?

The periods for the recoupment of outlays are of tremendous importance under socialism. But recoupments may be of a different kind. As pointed out earlier, in socialist society outlays are recouped by a rise in the productivity of social labor. But profitability of production depends not only on the productivity of social labor, but on factors of distribution as well, in particular, on the accepted relationships between the growth of labor productivity and the increase of its payment, and on a national economic scale — between the consumption fund and the accumulation fund. To plan these relationships on a firm basis it is necessary first of all to appraise the effectiveness of outlays from the standpoint of the productivity of social labor.

3. A Single Measure of the Effectiveness of Capital Investments

The main problem in measuring the effectiveness of capital investments both for an enterprise, a branch and for the entire national economy is to bring the measure of this effectiveness as near as possible to the productivity of social labor. Such a measure at present (so long as the method of calculating the social outlay of working time for the output of separate kinds of production is not mastered), it is universally recognized, is the national income in comparable prices calculated per person employed in the productive sphere. Since the national income is made up of the net output of branches and enterprises, there is an objective basis for measuring the degree of influence of each variant of capital investments in some sector of the national economy on the size of the national income per person employed in the productive sphere.

Whatever the methods for measuring the economic effectiveness of outlays, in practice they are needed only for commensurating the economic effectiveness of the various types of outlays. If there is only one variant of capital investments for a new project, reconstruction, purchase of a machine, etc., the problem is to commensurate the effectiveness of this variant with the effectiveness of operating fixed capital. But if it is a matter of commensuration, there is no need to determine the absolute saving of social labor achieved through some or other outlays. It is sufficient to know which of the compared variants yields the greatest saving of social labor and, practically, the largest increase of the national income per person employed in the productive sphere.

Further, the problem of commensurating the effectiveness of capital investments can be solved only if the variants compared are homogeneous in their purpose. Otherwise the difference in outlay of social labor will not at all testify to a different level of productivity of social labor.

And so it is necessary to commensurate different variants of capital investments in projects designed for the production of a given volume and composition of output and to determine which of these variants increases to a greater extent the size of the national income calculated per person employed in the productive sphere.

Let us turn to the calculation of production outlays. In each of the variants we will determine the magnitude of material outlays in the wholesale prices of enterprises and deduct them from gross output. This will be net output in comparable prices. If the number of workers in the different variants is the same, that variant of the project which secures the largest net output will also increase to a greater extent the national income calculated per person employed in the productive sphere.

But variants of projects also differ for the most part in the number of workers in the enterprise. If in one variant the net output is larger and the number of workers is smaller than in the other variants, no calculations are needed: this variant is undoubtedly more economical.

The problem of determining economic effectiveness arises in practice when the material outlays in one variant are greater than in another, while the outlay of human labor is smaller, or vice versa.

In these cases the more effective variant is the one in which a decrease in the national income as compared with another variant through one of the outlay elements is more than compensated for by a gain through the other element.

The net output of a branch (enterprise) in comparable prices enters directly into the composition of the national income. Therefore the difference between the net output in the two variants expresses the sum of the national income which society will get additionally by using the fixed capital

of one variant as compared with another.

To express the saving of human labor in the given sector of the national economy in terms of an increase of the national income it is enough to multiply the difference in the number of workers in the two variants by the average output of national income (in comparable prices) per person employed in the productive sphere. At present this output amounts to about 2,000 rubles.

Thus it is possible to determine which of the compared variants of capital investments will yield a bigger increase of the national income with the same scale of output of the given composition and outlay of labor in the productive sphere.

For the national economy it is important, moreover, that the more effective variant of capital investments require a minimum of simultaneous outlays. To raise the productivity of social labor in a number of cases a still greater increase of fixed capital per worker is needed, as a result of which the return on the fixed capital is reduced, or what is the same thing, capital investments per unit of output grow. But for the national economy it is important that the given rise in labor productivity be achieved not through any growth of fixed capital per worker, but through the minimally necessary growth, that is, with the maximally possible return on the productive fixed capital.

Let us designate:

C_e and T_e as the annual net output and the annual outlays of human labor (or the average listed number of workers) for the planned projects under the more effective variant of capital investments;

C_k and T_k as the same under any other variant of capital investments for the same volume and composition of output;

B as the approximate average magnitude of net output per employed person in the productive sphere during the period of operation of the planned projects (national income divided by the number of persons employed in the productive sphere);

K_e as the capital investments under the more effective variant.

Given these designations, the demands presented to the more effective variant can be expressed in the following formula (Formula 2*): (12)

$$C_e - C_k + (T_k - T_e). \quad B > O \text{ with a minimal } K_e$$

It is easy to demonstrate that if B is close to the net output per person employed in the given branch (enterprise) than Formula 2 is simplified and is reduced to the following:

$$C_e : T_e > C_k : T_k \text{ with minimal } K_e$$

But if the net output per person employed in the given branch (enterprise) differs sharply from the average for the national economy, the saving of human labor must be appraised by taking into account at least the approximate magnitude of B, the national income per person employed in the productive sphere. It is not difficult to determine in advance the magnitude B for a number of subsequent years with the degree of precision needed for the application of Formula 2.

The economic significance of Formula 2 fully coincides with the generally recognized formula of the productivity of social labor for the national economy as a whole. Indeed by comparing different variants of capital investments for their economic effectiveness we are searching for that variant which yields an additional increase of national income as compared with any of the other variants. All the variants are placed in the same conditions not only with respect to the volume and composition of the annual output, but also with respect to the number of persons engaged in the productive sphere.

The question arises, are the compared variants in the proposed formulas really placed in equal conditions? After all the differences in variants with regard to the periods of construction are not taken into account in these formulas. Moreover the minimum K_e does not at all mean that the capital investments of the more effective variant are smaller than capital investments under other variants. The minimum K_e merely means that the capital investments under the more effective variant are planned without any excess. K_e is the minimally necessary investments to secure C_e with T_e. But in such a case Formula 2, as it were, ignores the differences in variants with regard to the periods of construction and capital investments per unit of output. But this only appears to be a shortcoming of the proposed formula of effectiveness.

Under any method of commensurating effectiveness of capital investments, as we have shown, it is impossible to appraise the differences in construction periods of the compared variants without making calculations for the national economy as a whole. The same holds true of differences in variants with respect to capital investments per unit of output, insofar as they affect the productivity of social labor through inter-branch ties in the national economy.

To the extent to which capital investments per unit of output affect the size of the national income directly, and not through inter-branch ties, their significance is fully evaluated in Formula 2. If the periods of service of fixed capital, with account of their obsolescence, in the variants are the same,

*The original article does not designate any previous formula as formula 1 —Ed.

while the capital investments per unit of output differ, the amount of amortization for compensation of the fully used up fixed capital will differ. It will be larger in the variant with relatively higher capital investments per unit of ouput. But this is fully reflected in the magnitude of net output, inasmuch as in its calculation amortization is excluded from gross output together with the other material outlays.

For the national economy as a whole Formula 2 resolves into a demand for the largest increase of the national income with the given planned number of workers in the productive sphere.

Calculation of the effectiveness of investments in productive projects for the national economy as a whole also includes account of the influence exerted by differences in the volume and composition of the output of the national economy on the productivity of all social labor. Moreover in calculating the effectiveness of capital investments in the productive sphere as a whole it is now impossible to assume, as we did previously, that labor saved in the enterprises concerned will be utilized elsewhere. We are dealing here with the entire productive sphere. Consequently the number of workers in the different variants considered is a magnitude known in advance. In other words, $T_e = T_k$. Therefore Formula 2 acquires the following form:

$$C_e - C_k > 0 \text{ with the given } T \text{ and minimal } K_e$$

In this case C is the national income, because we are dealing with the influence of capital investments on the results of the interaction of all the means of society's labor in the process of their utilization. Thus if we designate national income as N, the demands made on the most effective variant of capital investments in productive projects of the national economy acquires the form expressed in Formula 3:

$$N_e > N_k \text{ with the given } T \text{ and minimal } K_e$$

Account must also be taken of the part of capital investments which will not be materialized in the average annual productive fixed capital, but will enter uncompleted construction at the end of the planned period. But the longer the planned period, the smaller the share of capital investments which is materialized in uncompleted construction at the end of the planned period. Hence it is in long-term planning that Formula 3 can be applied most fully. This corresponds to the nature of things because planning of capital investments has a strikingly pronounced long-term nature.

And so the influence of different variants of capital investments on the magnitude of the national income calculated per person employed in the productive sphere can serve as the single measure of effectiveness of capital investments both for the national economy and for any of its sectors, large or small. All the initial data for the application of the proposed method of commensurating the effectiveness of capital investments are fully available under the existing system of prices and calculation of outlays and the existing practice of planning capital investments in some or other projects of new construction, expansion and reconstruction of operating enterprises or mechanization and automation of production processes.

Let us return to our example.

To apply Formula 2 it is necessary to single out material outlays from all the production outlays. Let us assume that in the fixed variant they amounted to 75 million and in the second variant to 72 million rubles. In the first variant net output will be 120 - 75 = 45 million rubles, and in the second variant, 120 - 72 = 48 million rubles. It would seem that according to the size of net output the second variant is likewise more economical. But the matter looks entirely different if we taken into account the net output which the national economy can receive as a result of the saving of human labor in the first variant as compared with the second. If we take the average production of net output in the productive sphere as being equal to 2,000 rubles, then by using Formula 2 we obtain:

$$45 - 48 + (23 - 20) .2 > 0$$

The first variant is more effective because the reduction in net output by 3 million rubles at the given enterprise as compared with the second variant is more than compensated for by the additional net output of approximately 6 million rubles which the labor saved in the national economy can yield.

Is the national economy in the given year able to allot the money for the more economical first variant or must it defer this variant owing to a shortage of funds? If the first variant demands longer periods of construction, is the gain in the productivity of social labor in the next few years adequate to compensate for the slowing down of the turnover of capital investments? These questions, as we have already emphasized can be solved only when working out the national economic plan as a whole, determining the influence of construction periods and capital investment per unit of output on the productivity of social labor, but now with account of the inter-branch ties.

And so the method of commensurating the effectiveness of capital investments by their recoupmen

hrough profit, or, what is the same thing, by the rofitability of the planned production can lead to in-orrect conclusions about the optimal variant of cap-tal investments.

The index of profitability is of exceptionally great mportance in conditions of cost accounting. It does ot follow, however, to give it forever the non-ntrinsic function of measuring labor productivity.

In order to commensurate the effectiveness of out-ays by their influence on the productivity of social abor, it is already possible, without any changes in he price system and without calculating outlay of vorking time, to use the index of national income in omparable prices per person employed in the pro-uctive sphere. This will prevent an incorrect de-ision in choosing the optimal variants of capital nvestments.

Footnotes

(1) Here and subsequently we have in mind capital nvestments in the productive sector of the national conomy.

(2) Tipovaia Metodika Opredeleniia Ekonomicheskoi Effektivnosti Kapital'nykh Vlozhenii i Novoi Tekhniki v Narodnom Khoziaistve SSSR, Gosplanizdat, 1960, p. 6.

(3) K. Marx, Capital, Vol. I, 1953, p. 52 [Russian edition].

(4) Planovoe Khoziaistvo, 1961, No. 1, p. 54.

(5) N. S. Khrushchev, Rech'na Mitinge Stroitelei Volzhskoi Gidroelektrostantsii Imeni Vladimira Il'icha Lenina 10 Avgusta 1958 Goda, Gospolitizdat, 1958, p. 13.

(6) Op. cit., p. 10.

(7) Planovoe Khoziaistvo, 1961, No. 3, pp. 58-59.

(8) Op. cit., p. 10.

(9) Planovoe Khoziaistvo, 1961, Nos. 1 and 3.

(10) Planovoe Khoziaistvo, 1961, No. 3, p. 53.

(11) Planovoe Khoziaistvo, 1961, No. 1, p. 54.

(12) The proposed method was stated by the author in detail in the book Planirovanie Kapital'nykh Vlozhenii, Gosplanizdat, 1961.

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. KHACHATUROV

reating the Material and Technical Base of Communism

nd Methods of Raising the Effectiveness of Capital Investments

The immense tasks of developing the country's conomy in the period of the comprehensive building f communist society require a deep study of the conomic effectiveness of capital investments and e factors that determine it, an economic analysis f the main directions of technical progress, meas-rement of the "return" yielded by funds invested in e key branches of industry destined to play a de-sive part in creating the material and technical ase of communism. The raising of such problems id their fruitful study have become possible as a sult of the elaboration by Soviet economists of the ethodological principles for determining the effec-veness of capital investments.

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The main index of the "return" yielded by capital investments in the national economy is the growth in the physical volume of the national income. It has grown 2.7 times in the last ten years and 4.4 times in the last 20 years. This increment is the result of the operation of two factors — the increase in the number of workers in the sphere of material production (to be more exact, the time worked by them) and the rise in the productivity of their labor. The number of workers in industry between 1950 and 1959 rose from 11.3 million to 16.8 million, that is, by 43%, according to data of the USSR Central Statistical Administration. During the same years the number of workers and other employees engaged in all forms of transport increased from 4.1 million to 6 million, or by almost 47%. There was no increase in the number

of people engaged in agriculture during this period.

The time worked by people in the sphere of material production, in view of the reduction of the working day, increased to a smaller extent than the number employed. On the whole, in 1959 the length of the working day was 4.5% less than in 1956. With account of the shorter working day the coefficient of the rise in the time worked was 1.42. Labor productivity in industry in 1959 was 1.87 times higher than in 1950. This data enables us to calculate approximately the coefficient of growth in the net output of industry. It is equal to the product of multiplying the coefficient of growth of the time worked by the coefficient of growth of labor productivity, that is, 1.42 x 1.87 = 2.65, or slightly more than the coefficient of growth of the national income during the same years (2.47). This is understandable since the net product of the other branches of material production — agriculture, transport, etc. — grew at a slower rate than the net output of industry. During the same period the coefficient of growth of labor productivity was 1.79 in the collective farms and 1.74 in the state farms; the net output increased to no greater extent since the number of people engaged in agriculture, far from rising, even declined in this period. In railway transport labor productivity in 1959 was 97% higher and the number of workers 16% greater than in 1950. Consequently the coefficient of growth of the net output was 2.29.

The rise of labor productivity — the chief factor in expanding the physical volume of the net output — is mainly the result of equipping the workers in material production with new, more improved instruments of labor, that is, a result of capital investments. Naturally improvement of the quality of work, greater skill and higher consciousness on the part of the workers, the introduction of advanced methods of labor, etc. also are of great importance. Better organization of labor and production, improved supply of material and equipment, etc. also make for a growth in labor productivity. All this leads to a higher level in the utilization of the previously created capital investments already made. To evaluate the level of effectiveness of capital investments in the national economy let us compare the dynamics of the productive capital, national income and capital investments.

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Fixed Productive Capital, National Income and Capital Investments in 1928-1960*

Year	Fixed productive capital of the national economy (in billions of rubles)	National income (in billions of rubles)	Growth of the national income as compared with the previous year (in billions of rubles)	Capital investments of state organizations and collective farms: Total (in billions of rubles)	Including investments in productive capital: in billions of rubles	Including investments in productive capital: % of total	Capital investments minus wear and tear, plus investments in circulating capital (billions of rubles)	Proportion of capital investments in fixed and circulating capital in the national income (in %)	Annual growth of national income, in % of capital investments made in the preceding year
1928	23.9	6.4	—	0.9	0.7	75	0.6	10.0	—
1940	61.1	32.7	—	5.2	3.7	71	3.5	10.7	—
1950	77.6	53.8	—	10.4	7.6	73	7.2	13.4	—
1955	121.9	92.0	—	18.6	13.4	73	12.8	13.9	0.75
1956	136.0	102.4	10.4	21.4	15.6	73	14.8	14.4	0.49
1957	148.0	109.5	7.1	23.8	17.4	73	16.5	15.1	0.82
1958	164.0	123.1	13.6	27.4	18.6	68	17.7	14.4	0.53
1959	173.9	132.5	9.4	30.9	21.1	68	20.0	12.2	0.58
1960	—	144.0	11.5	35.1	—	—	—	—	—

* Here and subsequently all value indices are given in the new prices.

The table requires some explanation. The absolute figures characterizing the scale of productive capital and national income for 1928 to 1959 have been calculated on the basis of the relative indices of growth published in the statistical annual of the USSR Central Statistical Administration, Narodnoe Khoziaistvo SSSR v 1959 Godu, the data on the evaluation of the fixed capital of the USSR economy as of January 1, 1960, and also the information on the national income contained in the report of the Central Statistical Administration on the results of the fulfillment of the national economic plan for 1960. The fixed productive capital was evaluated according to the full replacement cost on January 1, 1960, without deduction for wear and tear, which amounted to about 25% of its value. If the value of wear and tear is deducted the sum of productive capital is almost equal to the national income for the corresponding years. This speaks for the high degree of utilization of productive capital in the Soviet Union. In other countries, the United States, for example, the relation of the national income to the fixed productive capital is much lower. But in measuring the "return" on capital account should be taken of the entire sum of capital including circulating capital. The latter makes up on average about 25% of all the productive capital. Thus the figures in the table giving the replacement cost of the fixed productive capital without account of wear and tear are approximately equal to the sum of fixed capital minus wear and tear and the circulating capital.

Data on capital investments in productive capital are calculated as the sum of capital investments in industry, construction, agriculture (including capital investments of the collective farms) and transport. A certain share (about 25%) of the capital investments goes for replacing worn out fixed capital. In measuring the effectiveness of investments in the expansion of productive capital this share, which insures only simple reproduction of the capital, should be deducted from the total sum of capital investments. On the other hand, it is necessary to add to capital investments in fixed productive capital the investments which go to increase the circulating capital, which make up about 20% of all investments in productive capital. Thus the total sum of "net" capital investments, that is, investments securing a growth of productive capital, should be about 95% of the investments in fixed productive capital.

In measuring the effectiveness of capital investments by the increment of the national income resulting from the growth in the mass of productive capital functioning in the national economy, account should be taken of the fact that the investments and commissioning of the projects in which the investments are made do not coincide in point of time. This time gap is determined mainly by the periods of construction, which so far are very long. To measure this gap exactly it would be necessary to calculate the duration of construction for separate projects of capital investments. A reduction in the volume of uncompleted construction may tend to narrow this gap somewhat. On average the gap between the moment the investments are made and the time the projects are commissioned is about one year. This means that capital investments in a given year should be compared with the growth of the national income in the next year.

Part of the growth in the national income of a given year, as pointed out earlier, is a result of the mobilization of the internal reserves of production; it is not connected directly with expansion in the mass of functining productive capital. Nevertheless, in calculations the entire increment of the national income is compared with the capital investments in fixed productive capital. At first glance such a method of calculation overestimates the effectiveness of capital investments. But it should be borne in mind that the effect of capital investments made in the previous year is not limited to an increment in the national income of the given year; it will make itself felt in subsequent years until the new productive capital has been fully assimilated. This effect is not reflected in a comparison of the growth in the national income in the given year with the capital investments made in the preceding year. It may be held that these two errors — overestimation of the index of effectiveness by crediting the entire growth of the net output to capital investments and underestimation of this index by not calculating the effect to be received in future, in subsequent years — compensate each other.

For the entire national economy the dynamics of the index of effectiveness of capital investments depend on the change in the proportions between the national income and the productive capital. With respect to value these proportions change under the influence of the relationship between the masses of materialized and living labor used in production. Owing to the rise in the share of materialized labor invested in the means of production, the magnitude of productive capital expressed in value might grow faster than the new value produced by living labor. (1) Thus the relation of the value of the national income to the value of the productive capital or the relation of the growth of the national income to capital investments in productive capital will decline.

The dynamics of the national income and productive capital, expressed in unchanging prices, might be different. The introduction of ever more

improved instruments of labor and technological processes and the rise in the skill of the workers bring about a constant growth in labor productivity. That is why the absolute increase in the physical volume of the social product and the national income outstrips the growth in the physical volume of capital investments. For a socialist society, in which the aim of production is not the accumulation of value, but an increase in the mass of produced material values, a faster growth of the physical volume of the national income in relation to the volume of the productive capital is of very great importance. Through the optimal combination of production and accumulation it makes possible the building of the material and technical base of communism and the attainment of an abundance of products in a historically brief period.

Let us now turn to the figures in the table. To begin with, they show that the national income is growing somewhat faster than the fixed productive capital. Between 1950 and 1959 this capital increased by 124% and the national income by 146%. As compared with 1940 the growth rate of the national income exceeds even more the growth rate of the productive capital. This speaks for a decline in the productive capital needed per unit of output.

At the same time the productive capital per worker is increasing, as shown by the following comparison. While the productive capital of the national economy increased by 124% (in unchanging prices) between 1950 and 1959 — and in industry and construction by 144% — the number of workers in industry rose by 43%; between 1955 and 1959 the expansion in the productive capital of the national economy amounted to 43% (it was the same in industry and construction), while the number of industrial workers rose by 11.8%. Inasmuch as in the other branches of material production the number employed rose at a slower pace than in industry, the productive capital per worker in the entire national economy increased still faster.

But the growth in labor productivity lagged behind the expansion of productive capital. Thus labor productivity in industry rose by 87% between 1950 and 1959, while productive capital in industry and construction grew by 144%. Between 1955 and 1959 labor productivity in industry registered an increase of 30%, while the productive capital grew by 43%. Hourly productivity of labor rises faster than the average annual productivity, but it nevertheless lags behind the expansion in productive capital. This lag restrains the decline of this capital per unit of output. If labor productivity were to rise in proportion with the mass of the productive capital employed (experience shows that if the potentialities of modern technology are properly utilized it is possible to achieve a rise in labor productivity several times greater than the expansion of capital), the national income in its physical expression would grow much faster. Hence the need for a more critical evaluation of the new instruments of labor which are planned for introduction from the standpoint of their effect on the growth of labor productivity. Better use of available instruments of labor is likewise of great importance.

The table also shows that the capital investment in productive capital equal approximately the annual increase of capital. The non-conformity of these two magnitudes in some years is explained by the fact that the period when the investments are made precedes the period when the construction projects are commissioned and listed in the fixed capital. In view of the gap in time between the outlay of capital and the resultant material effect, the growth of the national income was compared with capital investments in the preceding year. The relation of the annual growth of the national income to capital investments differs greatly for various years, from 0.49 to 0.82 and has averaged 0.63 for the past five years.

The effectiveness of capital investments can be characterized not only by the growth in the physical volume of the national income, but also by the relation of the annual saving on production costs to the capital investments. Such a method of measuring the effectiveness of capital investments has a somewhat conditional nature owing to the fact that the level of production costs is influenced not only by the introduction of the new instruments of labor by means of capital investments, but also by the improvement of production organization, the utilization of internal resources, etc. But a comparison of capital investments with a decline in production costs undoubtedly is of interest because it makes it possible to establish a quantitative relationship between these two important indices and to learn at what price the reduction of production costs was achieved.

In the last five years the production costs of industrial output declined by 1.5 to 2% annually on the average. In railroad transport the rate of decline in the cost of traffic exceeded 5%; in agriculture production costs declined at a slower pace than in industry. The average reduction of production costs in the national economy as a whole in recent years may be taken at 1.7%. In absolute terms, according to an approximate appraisal, this amounted to about five billion rubles on the basis of the volume of output in 1960. Capital investments in fixed and circulating capital in 1959 amounted to 20 billion rubles. Thus the recoupment period of capital investments in the

national economy is about four years.

Let us examine the dynamics of capital investments. The table shows that after 1957 the share of the productive capital investments in the national income tended to decline. If, however, we add to the productive capital investments the investments in non-productive fixed capital, their total rose from 19.3% of the national income in 1950 to 24.6% of the national income in 1960. The rapid rise of outlays for non-productive fixed capital reflects the natural tendencies of development of consumption in the period of the comprehensive building of communism. The most vital requirements — in food, clothing, etc. — have a natural limit. As they are satisfied an ever greater part in the further advance of material well being is played by the intensive expansion of non-productive fixed capital — the building of well-built housing, theaters, clubs, stadiums, sanatoria, etc. These shifts in the structure of consumption which will become increasingly pronounced in the period of the comprehensive building of communist society are also reflected in the table in the relationship between investments in productive and non-productive fixed capital. The rise in the share of capital investments in the national income in recent years is a result of greater investments in non-productive capital, housing occupying the first place.

Naturally a relative reduction of capital investments in the productive sphere does not mean a decline in the growth rate of social production. The latter depends not only on the share of the national income used for capital construction, but also on the kind of projects in which the investments are made. In the present conditions of scientific and technical progress the rational use of new instruments of labor ensures a rapid rise in the productivity of social labor and an increase in the volume of output with a relative reduction in capital outlays. Such major directions of technical progress as over-all electrification, automation, mechanization, and the use of chemical products and processes in production are powerful factors for reducing the amount of capital per unit of output needed for social production.

The main economic advantage of electrification is the concentration of electricity production at large power stations and the supply of power to entire areas with many thousands of consumers from one center. The advantages of electricity as a power-carrier are also bound up with the use of cheap sources of energy, including water, wind, etc. The socialist economic system makes it possible to utilize in full measure the main advantage of electrification, the centralized production of electricity at large district electric power stations united in power systems. In the USSR about 90% of all the generated electricity is produced at district electric power stations. A kilowatt-hour of electricity produced centrally and transmitted to the consumer requires smaller capital investments per unit of output and smaller operating outlays as compared with an isolated power supply of each consumer from his own power installation. Capital investments per kilowatt of installed capacity and the cost of producing power at small stations are five to ten and more times higher than at large plants.

In the course of creating the material and technical base of communism the concentration of electric power production at large power stations will continue to grow. At present thermal electric power stations with a capacity of 1.2 million and 2.4 million kw. and hydroelectric stations with a capacity of five million kw. and more are being designed and built. The capacity of units is also being enlarged: steam turbines of 300,000 kw. are in operation; steam turbines of 600,000 kw. are being manufactured; turbines with a capacity of one million kw. are being designed — nearly two Dnieper Hydroelectric Stations in one unit! The capacities of hydroturbines are being increased as well: 100,000-kw. turbines have been installed at the Kuibyshev Hydroelectric Station and 110,000-kw. turbines at the Stalingrad station; 200,000-kw. turbines are being manufactured for the Bratsk station; turbines of 500,000-kw. are being designed for the Krasnoyarsk station. At the future gigantic Lena station turbines with a probably capacity of one million kw. will be installed.

The larger capacity of stations and turbines leads to a reduction of capital investments and production costs per unit of electricity. At thermal stations with a capacity of 2.4 million kw. capital investments per unit of output are 20% smaller than at stations with a capacity of 600,000 kw.; capital investments per unit of output are 17% smaller in blocks with a capacity of 600,000 kw. than in blocks with a capacity of 150,000 kw. Capital investments per unit are similarly smaller in larger hydroelectric stations. At the biggest hydroelectric stations with a capacity of 3.5 to 6 million kw. they are 50 to 60% smaller than at hydroelectric stations with a capacity of 100,000 kw. On the whole capital investments per unit of output at thermal electric stations during the present Seven-Year Plan period are 24% lower than in 1958 and at hydroelectric stations — 53% lower.

Concentration of production of electric power not only reduces the capital investments per unit of output but also cuts production costs. At thermal electric stations commissioned in the Seven-Year Plan period the cost of generating electricity will

be 27% lower than at stations operating in 1958, and at hydroelectric stations — 53% lower.

A reduction in the cost of generating electricity by 5 to 7% annually on the average will yield a saving of tens of millions of rubles. But the economic effectiveness of large electric power stations is not limited to this. Electrification makes it possible to reconstruct technology along modern lines in all branches of production, agriculture included, and in all areas of the country. Electrification promotes higher labor productivity in the entire national economy, and above all in industry. How growing power facilities per worker influence the growth of labor productivity is shown by the following data (1940 = 100):

	1955	1959
Power facilities per worker in industry	225	275
Labor productivity in industry	198	257

Between 1950 and 1959 both power facilities per worker and labor productivity in industry grew almost at an equal rate — 7% annually. Since the share of wages in the cost of industrial production is about 20%, the absolute annual saving in costs as a result of raising labor productivity by 7% will exceed two billion rubles annually. Of course it would be wrong to credit the entire saving to the growth of power facilities per worker, but undoubtedly there is a natural connection between larger power facilities per worker and the rise in labor productivity; a considerable part of the saving on production costs in the national economy should be regarded as a result of electrification.

Concentration of production reduces capital investments per unit of output not only in the electric power industry but in other industries as well. Before the war the largest blast furnaces in the ferrous metal industry had a volume of 1,000 to 1,200 cu. m.: furnaces of 1,500 cu. m. have been cuilt in postwar years and future plans call for furnaces with a volume of 2,000 to 2,700 cu. m. As the volume of the furnaces grew, capital investments for the annual production of one ton of pig iron have declined, for example, from 5.8 rubles in operating furnaces of 1,033 cu. m. to 4.8 rubles in furnaces of 1,700 cu. m. Converters of increased capacity, 100 to 250 tons, and open-hearth furnaces of 400, 600 and 800 tons are also yielding a big economic effect. Bigger capacities of converters and open-hearth furnaces cut capital investments per ton by 15 to 20% and more.

In the oil refining industry the increase in capacities of atmospheric-vacuum installations from three million to six million tons reduces capital investments per installation by 1.5 million rubles and production costs by 10% and raises labor productivity by 25 to 28%. The doubling of the capacity of catalytic cracking installations — from 750,000 tons to 1,500,000 tons annually — brings about a reduction of capital investments per ton of 33%. An increase in the diameter of oil pipelines from 520 to 820 mm. cuts capital investments per ton of transported oil almost by 50%. In the chemical industry the doubling of the capacity of polyethylene factories lowers capital investments per ton of output by 37%. Vinyl acetate factories with an annual output of 800 million rubles require 54% less capital investments per ton of output than factories with an annual production of 200 million rubles; in ethylene factories with an annual production of 60,000 tons capital investments per ton are 31% lower than at factories with an annual output of 30,000 tons. In the construction materials industry capital investments in factories with an output of 75,000 cu. m. of ferro-concrete items are 24% lower than at factories with an output of 30,000 cu.,. Capital investments in a cement mill with an annual productivity of 1,350,000 tons are 26 to 32% lower per ton than at a cement mill with an output of 900,000 tons, etc. Concentration of production in agriculture is also highly effective.

Of course concentration of production has its economic limits. In general, both capital investments per unit of output and production costs are lower at large enterprises than at small ones and labor productivity is higher. But the bigger an enterprise, the larger must be the area for the sale of its output and, consequently, the higher the transportation and other expenses connected with its sale. Concentration of production beyond certain limits may also cause an increase of factory outlays, for example, in case of an excessive increase of the size of shops, more intricate transportation within the enterprise, etc. This also sets bounds to production concentration. Lenin pointed out that the "law of superiority of large-scale production is by no means as absolute and simple as people sometimes think." (2) Consequently it is necessary to choose the most advantageous degree of production concentration taking into account the specific features of branches, so that the outlay of social labor is minimized.

Comprehensive mechanization and automation of production, one of the main directions of technical progress, yields a tremendous economic effect. According to available estimates, capital investments for these purposes in only 11 industries will

amount to 7.6 billion rubles in the course of the Seven-Year Plan period. But the "returns" too will be very large because the rational utilization of modern means of automation and mechanization bring about a great rise in labor productivity. The task is to secure planned comprehensive mechanization first in those branches where it produces the biggest economic effect. Then a reduction is achieved not only in production costs but also in capital investments per unit of output. According to the same calculations, in 1965 the saving on production costs will reach 3.7 billion rubles, that is, half of the investments in mechanization and automation will be repaid in one year.

The 21st Party Congress has set the task of abolishing arduous manual labor in industry, agriculture, construction and transportation through the comprehensive mechanization of production. As a result the labor force needs will be reduced by 3.8 million people as compared with the number that would be needed if existing equipment were used.

For outlays on comprehensive mechanization and automation to yield the maximum effect it is necessary to cut the cost of producing these means of mechanization and automation. Frequently the effect of mechanization and automation is evaluated only in terms of the reduction in the outlay of human labor or at best the saving on current outlays. As a result some models of progressive technology prove to be excessively expensive, some automated lines do not yield the appropriate effect and at times their introduction and operation causes losses. It is impermissible that designers of automated lines at times evaluate their effectiveness solely on the basis of the reduction in labor outlay per unit of output. Economic calculations should take into account all production costs, including material outlays and overhead expenses which, as is known, frequently are two to three times higher than the expenditure on the wages of production workers. Unfortunately in the practice of calculating production costs of plants overhead expenses are often credited to the various items produced proportionally to the wages of production workers. Inasmuch as under automation the expenditure on wages of production workers is sharply cut, overhead expenses on automated production are underestimated, although in reality the operation of some means of automation not only does not reduce shop and general factory outlays, but on the contrary, increases them.

But to establish correctly the cost of production under automation is only one aspect of the matter. It is no less important to know at what price the cut in production costs is achieved, what the capital outlays are, the cost of manufacturing and installing the means of mechanization and automation. To cut the capital investments per unit of output in automated production it is necessary not only to reduce the cost of automatic lines but also to load them fully. At times automatic lines are utilized to the extent of 50 to 60% of capacity and even less. To remove the attendant losses it is very important to improve the organization of production throughout the entire engineering industry and above all to deepen specialization and organize more precise cooperation between enterprises.

The economic advantages of specialization and cooperation are far from being fully utilized. These progressive forms of organizing industrial production are realized chiefly on the scale of separate economic areas. Specialization and cooperation between areas is still inadequately organized and planned. Determination of the optimal schemes of specialization and cooperation by comparing the savings on capital investments and production costs as a result of production concentration with the additional outlays for the supply of large enterprises and the transportation of their output to the consumer — here is one of the main tasks in studying the effectiveness of capital investments in the national economy.

Extensive development of the engineering and instruments industries is necessary for the successful introduction of over-all mechanization and automation in all branches of the economy. Calculations demonstrate the high effectiveness of investments in these industries. As the material and technical base of communism is built up, a substantial increase in their output will be required. Capital investments per unit of output in such industries as electrical equipment, tractor and agricultural machine construction will be substantially reduced in the Seven-Year Plan period. Simultaneously the cost of production will be cut by 17 to 20% and labor productivity will rise by more than 70%. All this is largely determined by the technical advance of the engineering industry. According to calculations of the State Committee on Automation and Engineering, capital investments for over-all mechanization and automation are recouped in the engineering industry in periods ranging from 6 months to 3.5 years.

Study of the effectiveness of capital investments in the engineering industry makes it possible to determing which is more economical — to build new enterprises or reconstruct existing ones. In branches in which production of single units or small series prevails (for example, in heavy engineering) it is more efficient to increase capacity chiefly by reconstructing existing enterprises. This makes it possible to utilize available buildings, engineering networks, intra-plant transport facilities and

sidings. This brings about a reduction of both capital investments and production costs as compared with the building of new enterprises. Capital investments per unit of output in the reconstruction of heavy engineering works are 1.5 to 1.6 times less than in the building of new enterprises. In the Seven-Year Plan period 85% of the entire increase in the output of these branches of the engineering industry will be obtained through reconstruction.

It would be wrong, however, to think that this is the only effective way of developing the engineering industry. Economic calculations show that in branches with large-serial and mass production (automobile, tractor, agricultural machinery industries) the biggest reduction in capital investments per unit of output and production costs is achieved by means of building new highly specialized plants. This creates favorable conditions for the application of the latest machinery, technological processes and organization of production, which frequently is unfeasible when re-equipping plants built according to obsolete technical standards. Highly specialized plants which manufacture separate parts and units for the entire engineering industry are advantageous only if production is on a sufficiently large scale designed to satisfy the requirements of enterprises in a number of contiguous areas. New construction is also effective in plants of the assembly type designed for mass production. Narrow specialization and mass production create the conditions for the introduction of highly economical automation schemes.

A revision of designs of articles and blanks with the object of raising their technological level, of making them more suitable to conditions of automated production represents a big reserve for raising the effectiveness of capital investments in automation. At times an insignificant change in the design of an article may sharply increase the effect of automation. A big role in this respect is played by the use of plastics and other synthetic materials, alloy steels, etc.

The greater use of chemical products and processes is an important direction of technical progress which will ensure greater effectiveness of capital investments in the national economy. It not only reduces the cost of production in the chemical industry itself but at the same time reduces production outlays in different enterprises consuming this output. The production of plastics, for example, is highly effective economically. The capital investments needed to produce one ton of plastics (including related investments in the raw material branches and the power industry) are from 3 to 6 times smaller than the capital investments needed for the production of such non-ferrous metals as lead, aluminium or copper. If the calculation is made not on the basis of weight but of volume (which is more correct in view of the lower specific gravity of plastics), we find that capital investments per unit of volume of plastics are 3 times smaller than for the same unit of volume of one of the cheapest metals, steel. The saving obtained through the use of plastics in the cable industry alone will reach one billion rubles in the Seven-Year Plan period. Capital investments in the production of synthetic rubber are highly effective. The total saving on capital investments in the development of the tire and its allied industries owing to the use of new types of synthetic rubber will amount to 1 to 1.5 billion rubles. Moreover the saving in motor transport as a result of using new tires will total about three billion rubles in the Seven-Year Plan period. Investments in the production of artificial fiber, artificial leather and synthetic fats are likewise effective. These branches ensure an economy in capital investments as compared with investments in the production of the corresponding natural products. The manufacture of synthetic fabrics, leather and fats also requires much smaller labor outlays, 4 to 8 times less, than the production of the respective articles of plant or animal origin. The indirect effect should also be taken into account: development of the production of synthetic alcohol and fats makes it possible to release large quantities of edible raw materials — potatoes, grain, vegetable oil — for the supply of the population. The effect of such chemical products as fertilizers is realized chiefly by the consumers, that is, in agriculture. The economical nature of their production cannot be evaluated without taking into account the higher productivity of agriculture.

The example of the chemical industry shows that the economic effect must be measured not only by the reduction of capital investments per unit of output and production costs of one or another item, but also by the additional effect which the consumer receives from the application of the given product. This holds good for a number of other industries as well. Thus in the ferrous metal industry the rolling of sheet steel or special shapes may require additional outlays, but they will be more than compensated for by the saving in the engineering industry. The additional investments for the production of a lorry of new design with higher speed and a more economical motor will be more than compensated for by the saving obtained by the economy as a result of the faster turnover of the lorries, quicker delivery of freights and lower fuel outlays. Account of such indirect effects in choosing the most rational directions for the development

f modern technology is of great importance.
The chemical industry is one of those branches here the advantages of production integration are specially great. For example the organization of itrate fertilizer production on the basis of coke ases at coke by-product shops of metallurgical orks yields a big effect; the same is true of the anufacture of a number of syntehtic substances at il refineries, the integration of enterprises for iscose cord production and the production of sulhuric acid and carbon bisulphide, etc. The chemial industry can also serve as an example of a ranch in which the choice of economical ways of delopment demands an assessment of the effectiveess of comprehensive capital investments for the rganization of a number of interconnected catebries of production in yielding a large saving as ompared with capital investments needed for the evelopment of each category of production separate-. It is very important for economic calculations ascertain properly the level of current production utlays for the manufacture of products comprehenively as compared with the variant of their isoted production. The most substantiated method of istributing the saving on production costs among the fferent products in the entire complex is to disibute them proportionately to the capital investents that would be needed for the production of ach of these items separately.

The intensification of production processes, their celeration, is an essential factor in raising the fectiveness of capital investments. Intensification ads to better use of fixed capital and consequently a reduction of capital investments per unit of outut, growth of labor productivity and reduction of rrent production outlays. For example, in the rrous metal industry improvement of the quality the charge, the use of an oxygen blast and operaon of furnaces at a stepped-up regime results in reater production of metal per unit of furnace volme, which can yield a big saving on capital investents. In the oil industry the speed of drilling ells is increased owing to the use of electric drills d diamond bits in deep drilling, which also reces the requirement in drilling installations for e given volume of work, that is, yields a saving in pital investments. A substantial reduction of capal investments per unit in the coal industry is enred by the use of the hydraulic method of mining which the technical process of extraction bemes continuous. With this method labor producvity is 2 to 2.5 times higher than in ordinary ining, while the cost of production is 50 to 60% wer.

In the building materials industry the accelerated rming and hardening of pre-cast reinforced concrete make it possible to increase the number of cycles up to two and even three per 24 hours, which reduces capital investments per unit of precast reinforced concrete by 50% and more, doubles labor productivity and cuts costs by 20% and more.

As a result of the transfer of the most important railroad trunklines to electric and diesel traction speeds are sharply increased and the traffic and carrying capacity of the lines is raised. Although capital investments per unit are somewhat increased in these forms of traction as compared with steam traction, the cost of freightage is greatly reduced and labor productivity grows.

The influence of modern scientific and technical progress on the dynamics of effectiveness of capital investments in the national economy, the growth in the "return" yielded by capital, has had inadequate study in our economic literature thus far. The difficulty of such investigations consists in the fact that the prospects of large changes in technology have not been delineated with sufficient precision. But even with regard to the developments in technology which are already being applied in industry there are not even approximate economic calculations of the possible effect of technical progress. It would be necessary right now to determine what effect there will be from the use of atomic energy in areas which do not have their own resources of mineral fuel and water power, what effect will be obtained from introducing the method of direct recovery of iron from ore, skipping the blast furnace process, from the automation of underground coal mining, the industrial use of chemical methods of producing so-called "unwoven fabrics," etc. Although the technology of these and many other prospective production methods has not been worked out finally, approximate calculations, based on some conditional parameters, would make it possible to determine more confidently the prospects of economic effectiveness of applying the latest scientific and technical discoveries which have revolutionary significance for the development of production. Such preliminary calculations are also necessary for choosing the ways for the most effective technological application of these discoveries.

Technical progress undoubtedly compensates for the unfavorable effect of a number of factors on the dynamics of capital investments per unit of output and the cost of production. Thus the development of new areas in the eastern parts of the country requires large capital investment. The growth of production in these areas will be achieved through the building of new enterprises and not the reconstruction of existing ones.

Capital investments are necessary for the equipment of industrial sites, the building of means of communications and the engineering networks to serve production. It will also be necessary to build modern cities with their intricate economies. All this may mean that capital investments per unit of output here will be higher than in the old areas.

An increase in capital investments per unit of output also results from the need to use ores with a lower iron content as the ferrous metal industry is further developed, and the use of oil deposits and other minerals located at greater depths. These factors, which make for higher capital investments per unit of output and for higher production costs, should be contrasted with the influence of technical progress and the modern organization of production which can yield a tremendous rise of effectiveness.

One of the principal factors in greater effectiveness of capital investments is an improvement in the economic indices of capital construction itself. Of great importance is the achievement of correct proportions between outlays on building and assembly work and on instruments of labor proper. Although the share of outlays on buildings and assembly work is declining, it is still too high. The structure of capital investments, specifying the share of outlays on building and assembly work and equipment, is given in the following table. (According to data of the Central Statistical Administration, in %):

	Building and assembly work	Equipment	Others
First Five-Year Plan	93	11	6
Second Five-Year Plan	79	14	7
3.5 years of the Third Five-Year Plan	77	16	7
4.5 years (July 1, 1941 - January 1, 1946)	76	16	8
Fourth Five-Year Plan	63	29	8
Fifth Five-Year Plan	63	28	9
1956	59	33	8
1957	60	32	8
1958	61	32	7
1959	62	31	7

The relationship between the active and passive parts of capital construction is much more favorable at present than in the First and Second Five-Year Plan periods. But in recent years the tendency has again been to increase the share of outlays on building and assembly work. The increase in the reconstruction of operating enterprises, whereas before the war new construction predominated, is in no small measure responsible for the decline in the share of building and assembly work. The experience of foreign countries, in particular the United States and the Federal Republic of Germany shows that the share of outlays on building and assembly work can be lower than on equipment. In comparing these indices with data for the USSR, account should be taken of the climatic conditions, the lower mean annual temperature in the USSR than in the United States and the Federal Republic of Germany and also the difference in the methods of classifying outlays on construction. But in addition to these factors it is necessary to take into account the fact that expenditure on reconstruction and modernization in the United States and the Federal Republic of Germany predominate over outlays for new construction. Account must also be taken of the shortcomings in the organization of designing and construction in the USSR which lead to superfluous outlays on building and assembly work.

On the basis of progressive construction decisions and an advance in the technical level of construction the share of outlays on building and assembly work, that is, investments in the passive part of the fixed capital can be reduced considerably. The designing of enterprises must be done comprehensively, utilizing the same construction site for the building of various enterprises, doing all the lay-out work, building of roads, communications, common sidings, transmission lines, etc. in advance. Of great importance is the erection of three-dimensional buildings, primarily of one-story, continuous structures of simple configuration without any protrusions, with a flat roof and increased column spacings which would make it easier if necessary to change the internal lay-out when going over to the manufacture of new types of goods or new equipment. Wider use of suspended or ground transport hoisting equipment and continuously operating modes of internal transport will make it possible in many cases to get along without overhead cranes which necessitate the use of greater weight-bearing structures of industrial buildings. It is also planned to replace internal automobile transport by rail and other forms of transport without rails. Lastly, great possibilities for reducing the cost of building and assembly work are inherent in the use of new types of building materials — synthetic materials, light concrete, asbestos cement and pre-cast reinforced concrete. All this will make it possible to cut the

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. OSADCHAIA

The Theory of "Balanced Growth"

On R. Harrod's Book Towards a Dynamic Economics)

The phrase "theory of dynamic economics" crops p increasingly in works which analyze and criticize ontemporary bourgeois political economy. Not long go Soviet economists had the opportunity of famil- rizing themselves with one of the most popular in ontemporary bourgeois literature, that of the ritish economist, R. F. Harrod. His book, Ver- ions of the Theory of Dynamics, which caused quite sensation in the bourgeois world and was reprinted ix times between 1948 and 1956 in Britain alone, as been translated into Russian by the Foreign iterature Publishing House.

Harrod is at present the leading exponent of the eynesian school in Britain. For several years he as editor of the Economic Journal. A pupil of eynes, he is a zealous apologist of the capitalist ystem. He published several theoretical works and rticles, chiefly on crisis problems, before World ar II. The book Toward a Theory of Economic Dy- amics develops some of the theses advanced in ese pre-war works; it is his first major post-war ork.

What in Harrod's theory attracts the attention of ourgeois economists? Why do scores of econo- ists in various capitalist countries either rehash is theory or make it more detailed, correct and evelop it?

The point is that Harrod has tried to answer the ost burning questions concerning the present, or ther the post-war, phase of capitalist develop- ent. He has tried to adapt the Keynesian theory, reated in the period of the "great depression" of e 1930's and responding in the first place to the emands of the times, to the new conditions in which pitalism found itself after the war. The problems alt with most in the bourgeois economic literature recent years is that of "economic growth." This due to the processes which have unfolded with rticular force in the present stage of the general isis of capitalism. The rapid expansion of the economies of the countries of the world socialist system and the further weakening of capitalism's position in the competition between the two systems, the collapse of the colonial system and the urgency of the question of the path of further development of the new national states, the growing instability of the economy in spite of state intervention, the increasing under-capacity operation of industrial plant and unemployment — all this explains the intense interest shown by bourgeois economists in the problems of economic growth. The works of many bourgeois economists on problems of economic development sound the alarm for the fate of capitalism. "The present interest in growth," writes the American economist Domar, "is not accidental; it comes on the one side from a belated awareness that in our economy full employment without growth is impossible, and, on the other, from the present international conflict which makes growth a condition of survival." (2)

Harrod has tried to fulfill the contemporary "social order" laid down by the monopoly bourgeoisie by elaborating the "balanced growth" theory, stated most fully in the work under consideration. Speaking of the difference between his theory and Keynes', Harrod writes: "A really healthy policy cannot be carried out if we intend to deal with the problem of unemployment (ad hoc) from one month to another and pay no attention to what level of capital investment should be maintained if the economy is to develop along the lines permitted by the basic conditions. I do not assert that there is anything radically wrong in the means proposed by Keynes. I believe only that in the final analysis they should be based on a somewhat different analytical approach and that they should be assessed on the basis of different criteria." (3)

Harrod regards capital investment as the main factor of growth. And for that reason he sees his chief task in determining the factors which define

the share of capital investments in a country's national income and in ascertaining the conditions in which capital investments will increase constantly, ensuring the maximum use of production capacities and manpower.

According to Harrod's theory the share of capital investment in the national income, in the case of long-term development, is determined by two factors: the rate of growth of the national income, which determines the growth of consumption, and the amount of capital outlays necessary per unit of output. He calls this last index the "ratio"; in bourgeois literature it is also called the "coefficient of capital." Harrod depicts economic growth as a process of continuous interaction between investments and the population's incomes. One side of this interrelation (investments — national income) has been dealt with by Keynes and is known as the theory of the multiplier. According to this theory, there is a multiplying relationship between new investments and the magnitude of national income, determined by the share of consumption in income and expressed by a certain figure, the multiplier. Taking this theory, Harrod links it with another theory which expresses the other side of the interrelation of income and investment, the theory of the accelerator. (4)

The latter assumes that an increase in income raises the demand for consumer goods. To satisfy this demand, it is necessary to increase the output of consumer goods. Therefore it becomes necessary to build new enterprises and that, in turn, enhances the demand for output of means of production. Thus the increase in income entails a series of new productive capital investments. This is repeated over and over again, only on a growing scale — new investments lead to increased incomes, increased incomes entail a series of new capital investments, etc.

This theory does express certain economic interdependencies which do exist between production and consumption. But, like Keynes and other bourgeois economists, Harrod ignores the peculiarities and concrete character of these interdependencies in capitalist conditions, and this deprives his analysis of considerable scientific significance. The multiplier, which establishes constant dependence between the amount of new investments and the growth of the national income, completely ignores the contradiction between production and consumption that is inherent in capitalism. Capital accumulation increases consumption, but not to the extent of the increase in output. The growth of the organic composition of capital proceeds in the same direction. Hence the relation between the amount of investment and the growth of the national income should undergo change in the course of development. But Harrod ignores precisely this change. It follows that the multiplier theory substantially distorts the nature of the connection between production and consumption under capitalism. The same applies to the theory of the accelerator.

In Harrod's theory production exists without its social form, without the relations of production. To sever production from its social form is to indulge in pure scholastics, to nail the door shut to research into the laws determining the developme of a given mode of production, and not of productio in general.

Harrod defines the conditions of "dynamic equilibrium," that is, of continued growth with the full use of production capacities. "The first question that should be posed," he writes, is this: "What should be the behavior of capital, how should the amount of capital change to make this change compatible with the growth of the other elements in conditions where the interest rate remains stable (5) In other words, he seeks to define what portio of capital accumulation accords with the condition of dynamic equilibrium. Proceeding from the theory of the accelerator, he determines the amou of capital accumulation under conditions of continued technical progress and no change in the nun ber of population and interest rate as a product of the rate of growth of the income (G) and the required coefficient of capital (C_r), that is, $S = C_r G$. The author assumes that the most important component of this relation — the required coefficient c capital (C_r) — is a constant value. In this he proceeds from his concept of "neutral technical progress," that is, from such technical progress which does not change the value of the coefficient of capital.

In brief, the essence of this concept is as follow there are two types of technical innovation. Some innovations save labor and increase capital outlay in relation to outlays for wages. Others, on the con trary, save capital and reduce capital outlays in relation to outlays on wages. On the whole they compensate each other and the relation between ca ital outlays and outlays for wages does not change

Harrod assumes that the concept of "neutral technical progress" essentially reflects the real tendency in the development of technical progress

Having determined the amount of required capit accumulation, Harrod proceeds to elucidate the next question: in what conditions will this require capital accumulation, determined by the rate of growth and the coefficient of capital, be equal to real accumulation or to the savings effected in cap italist society? Under capitalism, the portion of capital accumulation is not fixed according to need

known beforehand. It is a spontaneous process and as such is not determined by anyone. Consequently the question is to determine the rate of growth (G) under which real savings (S) would be equal to required investments. Harrod calls this rate of growth "warranted rate of growth" and defines it as G_w.

From the formula $C_r G_w = S$ he obtains $G_w = \frac{S}{C_r}$, where S and C_r are the given values. He assumes that the portion of savings in the national income is a constant value which allegedly also conforms to the real trend of development. Hence, from the point of view of the long-term development process (Harrod admits that in short-term periods, that is, in the course of cyclic development, S undergoes substantial vacillations), the warranted rate of growth will be expressed by a single constant value.

Harrod's concept is an attempt to express definite interrelations between the accumulation of social wealth, the growth of the national income and the technical conditions of production. The $S = C_r G_w$ formula shows what part of the national income should be accumulated in the case of given productive capital and a given rate of growth of income, which is identified with the growth of demand. This formula reflects the fact that the increase of output is linked with the expansion of consumption and depends on it. But every given mode of production engenders its own specific laws and motive forces of development. Capitalism is characterized namely by the fact that production expands not for the sake of consumption, but for the sake of profit. "It must never be forgotten," writes Marx," that the production of this surplus value — and the reconversion of a portion of it into capital, or accumulation, forms an indispensable part of this production of surplus value — is the immediate aim and the determining motive of capitalist production. Therefore it is never possible to represent capitalist production as something which it is not, that is to say, a type of production which has for its immediate purpose the consumption or production of consumption goods for capitalists. This would be to overlook the specific character of capitalist production, which reveals itself in its innermost essence." (6)

The connection between production and consumption under capitalism appears, in the final analysis, only during crises, when production is divorced excessively from its natural base — consumption. Harrod and his followers, though mentioning the connection between production and consumption in a general way, have not elucidated the pecularities of the effecting of these connections under capitalism.

But even from the point of view of reflecting certain general connections, Harrod's concept contains a number of serious flaws: the author proceeds from the stability of basic initial values — S and C_r, which does not accord with reality. Harrod and his followers refer to certain statistical findings obtained in the United States and Britain concerning the portion of accumulation in the national income and the value of the coefficient of capital. But it should be pointed out that the exponents of the theory of growth arbitrarily interpret even the data obtained by bourgeois statisticians. In particular, claiming that the portion of savings in the national income remains stable over long-term periods, they cite the data of the American economist Kuznets. But this data (7) testifies to just the opposite (see Table 1).

Table 1

Net Capital Investments as a % of the National Income (in 1929 prices)

Years	Net Capital Investments	Years	Net Capital Investments
1869-1878	13.7	1904-1913	13.1
1874-1883	14.4	1909-1918	13.0
1879-1888	14.6	1914-1923	11.4
1884-1893	11.1	1919-1928	10.2
1889-1898	16.2	1924-1933	6.0
1894-1903	14.8	1929-1938	1.4
1899-1908	13.6		

In the course of the entire period reviewed by Kuznets there was a decrease of the portion of accumulation, even if we ignore the 1929-1933 crisis and the ensuing depression, when it dropped to 1.4%. At the end of the 19th century it was 16% and at the end of the first quarter of the 20th century — 10.2%.

According to Kuznets' data, the coefficient of capital did not remain stable even over the long-run period (see Table 2).

Table 2

Relation of Reproduced Capital to Annual Net National Product

1879-2.83	1924-3.53
1889-2.99	1929-3.86
1899-3.36	1934-4.03
1909-3.40	1939-3.27
1919-3.76	1944-3.19

The coefficient of capital showed a tendency to rise right up to the 1930's, and this reflected the growth of the organic composition of capital. Further development is due to circumstances which were unrelated to technical progress.

The very high relation of capital to production in 1934 was to a large extent due to the drop in output during the 1929-1933 crisis and the depression that followed. The ensuing sharp reduction of the coefficient of capital is explained by the entry of the United States into the war, which was attended by growing utilization of existing production capacities.

In the post-war years the coefficient of capital came to 3.0 in 1948, 3.27 in 1950 and 3.21 in 1951. (9) The influence exerted in this period by the growth of the organic composition of capital, on the one hand, and the increasing output as the result of better utilization of equipment, the economy of materials on a social scale and the rise of labor productivity, on the other hand, compensated each other. The result was that the numerator and the denominator in the relation $\frac{\text{capital}}{\text{production}}$ increased approximately to the same degree. But it should not be concluded only on the basis of this post-war data that the coefficient of capital generally has a tendency to remain stable. But if S, the portion of capital accumulation, and C_r, the coefficient of capital, cannot be regarded as constant values even from the point of view of long-term development, the concept of the warranted rate of growth and especially the attempt to regard this rate as the ideal goal which capitalist society should strive to achieve are factually unfounded.

It is not accidental that Harrod's formula evoked serious criticism even from some bourgeois economists. The American economist Yeager, for instance, put it this way: "The growth theorists should explain just why S and $V[C_r]$ are as stable and non-adjusting as they must tacitly suppose. Until they do explain this, their ostensible conclusions, though set forth in a roundabout and impressive fashion and with much special terminology and much translation back and forth between algebra and English, remain mere unsupported assertions." (10)

Having defined the conditions of dynamic equilibrium, that is, the conditions of ideal development, Harrod proceeds to elucidate the "deviations" from the ideal conditions which occur in reality. He distinguishes long-term deviations, that is, long-term tendencies, from short-term deviations, that is, cyclic vacillations.

Harrod tries to explain the reasons for the prolonged upward and downward tendencies in capitalist development by the differences in the warranted and natural rates of growth. We have spoken of the warranted rate of growth above. What is the natural rate of growth?

According to Harrod's theory, the natural rate of growth is the growth permitted by the basic conditions of development: by the increase of the population, availability of natural resources and technical improvements. Unlike the warranted rate of growth, which ensures only the equality of savings and investments independently of the basic conditions of development and, therefore, does not always mean full employment, the natural rate of growth, Harrod claims, presupposes optimal utilization of society's resources and precludes unemployment. Here he poses the following question: are there any forces in capitalist society which could automatically level out the warranted and natural rates of growth? In other words, are there forces which automatically maintain dynamic equilibrium in conformity with the demands of the "basic conditions?" Inasmuch as savings, Harrod says, are the main parameter — one that depends on the will of people — in the determination of the rate of growth, study of this question boils down to study of savings. Are there any factors which would automatically stimulate a degree of savings which would correspond to the "basic conditions?" The bourgeois economists of the 19th century gave an affirmative answer to this question. They assumed that the interest rate was the mechanism which automatically brought the supply and demand for savings into line. Harrod has been compelled to deny this proposition: he has come to the conclusion that there are no such stimuli. Real savings, he says, can deviate over long-term periods from those needed for the optimal utilization of the available resources, and the warranted rate of growth will deviate from the natural, without there being any automatic regulators capable of inducing this equality. Proceeding from this, Harrod deals with three possible cases in relations between the warranted and natural rates of growth:

1) $G_w = G_n$. This case represents an ideal line of development, where all production capacities and available manpower are utilized.

2) $G_w > G_n$. In this case, writes Harrod, the economy will experience continued stagnation (depression).

Harrod's arguments may be illustrated in the following manner. Let us assume that the natural rate of growth is equal to 0.03. The relation of capital to output is equal to 3. In this case, the norm of savings, conforming to the natural rate of growth, will be: $3 \times 0.03 = 0.09$.

Let us suppose that the norm of savings increases to 0.12. The warranted rate of growth in this case will equal $\frac{0.12}{3} = 0.04$. The warranted rate of growth will exceed the rate ensured by

ıe economy in given limiting conditions (natural ıcrease of the population, level of technical pro-ress, etc.), that is, the natural rate of growth. The ıtter, therefore, is incapable of ensuring the growth f investments which could make full use of savings. ɔciety will suffer from chronic over-accumulation f capital. There will be surplus capacities, stock-iling, bankruptcy along with unemployment. In ıese conditions the economy will suffer for a pro-ɔnged period from under-capacity operation of in-ustry and chronic unemployment.

In such a case, Harrod says, the correct policy ould be a reduction of the savings norm, which ould also reduce G_w.

3) Reverse phenomena will be observed in the vent that natural growth exceeds warranted growth, $G_w > G_n$.

Let us suppose the norm of savings drops to 0.06. ı this case the warranted rate of growth will be $\frac{06}{3} = 0.02$.

The natural rate of growth, equal to 0.03, repre-ents demand for the savings norm of 0.09. There ill thus be a chronic lack of savings. The demand r investments will constantly exceed their supply, ith all the ensuing consequences — the more in-nse use of equipment, growth of profits, inflation, c. In this case, writes Harrod, an increase of ıvings would be expedient, for the value of it will rrespondingly raise G_w and bring it close to G_n.

The American economist Kurihara, an advocate this theory, writes: "Thus it can be stated that s long as the 'warranted' growth rate exceeds the utonomous' growth rate [as Kurihara calls the atural' rate of growth — I. O.], saving is a defla-ɔnary force. The logical need in this case is less ıving. Contrariwise, as long as the 'warranted' te is lower than the 'autonomous' rate, the sav-gs ratio represents an inflationary force. In this ɔposite case what is needed is more saving." (11)

Harrod's mathematical exercises, based on anti-ientific premises ignoring the laws of the capi-list economy, conceal the real nature of capitalist velopment. True, Harrod was forced to adopt a itical approach to capitalism's abilities as a self-gulating mechanism. He shows that capitalism is capable of following a line of stable development en from the long-term viewpoint, ignoring "short-rm vacillations." But the author does not go be-nd these admissions. What is more, he tries to duce the profound contradictions in the develop-ent of capitalism, the contradictions between the ces of production and relations of production, to ntradictions between production and the natural, asic" conditions of development. This is the ethod bourgeois economists almost always resort when they have to explain the shortcomings of capitalist society.

Can it be said, for instance, that the rapid rate of capitalist development in the latter half of the 19th century is explained by the fact that the natural conditions made the demand for investments constantly greater than the supply? Of course not. This period, the period of relatively rapid capitalist development, was shaped by the fact that the relations of production, and by no means the "natural" conditions, gave a certain scope to the development of the productive forces. Nor was this period an "age of inflation," as would follow from Harrod's theory. On the contrary, it was characterized by a relative stability of the monetary system with its free convertibility into gold and gradual reduction of prices. In between 1865 and 1896 the price index in the United States dropped from 130 (1926 = 100) to 50, although all branches of industry were going through a period of rapid upsurge. (12)

The chronic under-capacity operation of industry, chronic unemployment, deceleration of the rate of economic development, which characterize the general crisis of capitalism, are by no means due to the fact that the "natural" conditions have changed to such an extent that they prevent the full utilization of savings. It is not a question of "natural" conditions, but one of capitalism becoming overripe, of its production outgrowing the limits of its relations of production and becoming an insurmountable barrier for their further development. Harrod ignores the external and internal contradictions which are destroying the capitalist system. True, he admits that savings become excessive in such a period. To a certain extent this is an admission of the contradictions between production and consumption. But he does not explain why these excessive savings arise. He writes that in this period the norm of savings should be reduced. But what does that mean? It means increasing the workers' consumption and redistributing the national income in their favor. However the latter is impossible under the capitalist system because of its exploiting nature and its economic laws which inevitably engender contradictions between production and consumption.

Proceeding from his theory, Harrod also seeks to explain the nature of the cyclical development of capitalism, the nature of "short-term vacillations," to quote him. Hitherto it has been a matter of warranted and natural rates of growth. Harrod now introduces a third concept — actual rate of growth.

What happens when the rate deviates from the warranted or the natural? The solution of this problem, in Harrod's opinion, explains the nature of short-term vacillations or the character of cyclical development.

The essence of this concept of Harrod's is contained in what follows.

If the actual rate of growth exceeds the warranted, there arises an insufficient amount of savings. Striving to eliminate this insufficiency, entrepreneurs will increase the rate of growth output still more and as a result the gap between the supply of savings and their demand will become bigger and bigger. This may be illustrated by the following example. Let us assume that the norm of savings is equal to 12% and the capital outlays per unit of production growth comes to 3. In this case the warranted rate of growth is equal to 4% per annum ($3 \times 4 = 12$).

But here the actual rate of growth increases to 4.5% per year. With such a rate the norm of savings should be 13.5% per annum, and we have only 12%. Consequently, there will be a lack of investment goods. The opposite phenomenon, according to this theory, will be observed if the actual rate of growth drops below the warranted. Let us suppose that the actual rate falls to 3.5%. In this case the demand for savings will come to only $3 \times 3.5 = 10.5\%$ of the national income. That is less than the actual amount of savings, which come to 12%. There will thus be overproduction. And the situation will cumulatively deteriorate, for in conditions of overproduction the rate of growth will drop and will thus reduce the demand for investment goods.

"In the sphere of dynamics," writes Harrod, "the conditions are opposite to those in the static sphere. Instead of being self-extinguishing, deviations from equilibrium become self-increasing." (13)

This conclusion of Harrod's upsets the old canons of bourgeois political economy which pictured capitalism as a self-regulating mechanism. It is an admission of the inevitability of capitalism's cyclical development. But apart from this admission, Harrod's theory does not contain anything new; in essence, it by-passes the question of the reasons for crises and does not analyze the contradictions of capitalist reproduction.

According to Harrod a change in the rate of growth (engendering cumulative deviation in one or another direction) can be caused by purely accidental reasons.

The cumulative upswing is limited, Harrod says, by such natural factors as availability of manpower, technical conditions of production, etc., which determine the "natural" rate of growth. In turn, the crisis drop in output is halted by any accidental cause — a new invention, a new large-scale construction project — which presents a demand for investments and re-establishes the equality of the warranted and actual rates of growth until another accidental reason produces a discrepancy between them.

Harrod is unable to offer a really scientific theory of the cycle, for he ignores the capitalist form of production. The motive power behind the development of capitalist production is surplus value. It is the lever which moves capitalist production and at the same time imposes limits on its expansion. Marx made a profound analysis of the contradictions which develop and grow acute in the course of expanded reproduction and which in the end lead to crises. It is by no means a natural or accidental factor. It is, first and foremost, a contradiction between the social character of production and the private form of expropriation, which leads to the over-accumulation of fixed capital and sharpening of the contradiction between production and consumption. The tendency of the rate of profit to fall eventually raises a social (and not natural) barrier to further accumulation of capital.

The theory of reproduction, divorced from the relations of production and the laws governing the capitalist mode of production, as well as from a concrete analysis of historical development, is fruitless. Dealing only with the most general ties inherent in any form of production, it can only result in scholastic constructions which are far from reality and of little significance for research into capitalist reproduction.

What practical conclusions does Harrod deduce from his theory? They do not possess any sparkling innovations and are merely a repetition of the prescriptions for the saving of capitalism with the assistance of state policy, as suggested in his time by Keynes and developed by his followers. This means public works, international cooperation with the aid of the International Bank on questions of coordinating anti-cyclical policy, subsidizing housing, manipulation of budget deficits and creation of buffer reserves. All these measures are already being practiced in one measure or another by the capitalist states. But they have not produced and cannot produce the desired effect. The capitalist economy, developing in accordance with its inherent laws, is still being shaken periodically by crises of overproduction. As for long-term policy here too Harrod does not offer anything original. Emulating Keynes, he urges a reduction of the interest rate until its complete abolition, in order to create additional stimulants for capital investments, increased employment and full-capacity operation of industry. The reduction of the interest rate, he says, could ease the burden of the huge state debt and enhance opportunities for manipulating with the budget deficits. The abolition of interest, it is claimed, will restore "public respect for free enterprise" and create a completely new type of society, which will be an "alternative

collectivism." (14)

Harrod's arguments concerning the creation of a ociety "free of interest rate" is a reactionary, opian idea, advanced to rehabilitate capitalism, and spread the harmful illusion that the abolition of e interest rate will rid capitalism of all its contra- ctions. Capitalism cannot exist without a system private credit. And private credit cannot exist ithout interest, for it represents a share of the sur- us value going to the financiers. And even if it ere possible to substantially reduce the interest te (although in reality the reverse process is more kely), capitalism could not get rid of its contradic- ons. The chronic under-capacity operation of in- stry and unemployment are not caused by the high terest rate, but by the decay of the capitalist econ- my in the era of the general crisis, by the deepen- g of the contradictions between the production ca- acities and the conditions governing the sale of roducts.

Stable expansion of the economy is possible only the conditions of planned socialist economy. How- ver the defenders of capitalism, and Harrod is one them, are doing their best to ignore this truth. ith a zeal that could be used for better purposes, ey continue their quest for "new" methods of justify- g capitalism, "new" means of stimulating its crepit organism — methods and means that are in ality as old and useless as the capitalism they are rving.

Footnotes

(1) R. F. Harrod, K. Teorii Ekonomicheskoi namiki, Moscow, Foreign Literature Publishing use, 211 pages. [All quotations from this source have been retranslated from the Russian — Ed.]

(2) E. Domar, Essays in the Theory of Economic Growth, New York, 1957, p. 18.

(3) Harrod, op. cit., p. 114.

(4) Detailed critique of the multiplier and accelerator theories is contained in the articles of L. Al'ter, "Mul'tiplikator i Printsip Akseleratsii v Burzhuaznoi Politicheskoi Ekonomii," Mirovaia Ekonomika i Mezhdunarodnye Otnosheniia, 1960, No. 1, and P. Oldak, "O Sovremennykh Burzhuaznykh Teoruiakh Ekonomicheckogo Tsikla," Voprosy Ekonomiki, 1959, No. 2.

(5) Op. cit., p. 60.

(6) K. Marx, Capital, Vol. III, p. 254 [Russian edition].

(7) S. Kuznets, National Income, New York, 1946, p. 53.

(8) S. Kuznets, "Long-Term Changes in the National Income of the USA Since 1870," Income and Wealth of the United States. Trends and Structure, Cambridge, Mass., 1952, p. 82.

(9) D. Creamer, Capital and Output Trends in Manufacturing Industries, 1880-1948, p. 49.

(10) L. B. Yeager, "Some Questions About Growth Economics," American Economic Review, March, 1954, p. 59.

(11) K. K. Kurihara, "Growth Theory and the Problem of Economic Stabilization," Economics and the Public Interest, Robert A. Solo, Ed., New Brunswick, N. J., 1955, p. 276.

(12) C. H. Hession, The Dynamics of the American Economy, New York, 1956, p. 427.

(13) R. Harrod, Economic Essays, London, 1939, p. 264 [Retranslated from the Russian — Ed.]

(14) Ibid., p. 189.

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I. OLEINIK

Forms of International Division of Labor in the Socialist Camp

One of the laws of the development and consolidation of the world socialist system is the emergence and steady improvement of the socialist international division of labor, which becomes an increasingly effective factor in the economic, scientific and technological progress of the socialist countries, their economic consolidation, and the strengthening of the general economic base of the world socialist system.

International division of labor in the socialist camp has expanded considerably in the past few years. This is evidenced, notably, by the rapid increase in the volume of commodity deliveries among the socialist countries and growing exchange in manufactured goods and various kinds of raw materials and fuel. The socialist countries' volume of foreign trade practically trebled between 1950 and 1959; most of this trade was between the socialist countries, due chiefly to broader division of labor among them.

The forms of international division of labor in the socialist camp improve year by year. In the early stages of the formation and perfection of the division of labor between the socialist countries, its development in the main proceeded indirectly, through mutual commodity exchange on the basis of short-term and, later, long-term trade agreements.

The enhancement of the role of planning in economic development and of the unity and solidarity of the socialist states led to a gradual transition to direct coordination of the most important trends in the development of socialist international division of labor through the co-ordination of the socialist countries' national economic plans. This created conditions for expanding specialization and co-ordination of production in the interdependent branches of the national economies, as well as for the emergence and development of other forms of labor division among the socialist countries.

The elaboration of general long-term economic development plans for the period up to 1980 in the Soviet Union and most of the other socialist countries and the implementation of measures aimed at co-ordinating these long-term plans in accordance with the recommendations of the 13th Session of the Council of Mutual Economic Assistance mark the beginning of a new phase in the development of socialist international division of labor.

The transition to this stage of development of the division of labor in the socialist camp became possible as a result of the great successes attained by the world socialist system in all spheres of economic, political and cultural life. As a result of the triumph of socialist productive relations in the people's democracies and the gradual formation of the general economic base of the world socialist system, the sphere of operation of the economic laws of socialism and the possibility of using these laws more effectively to increase rapidly the productive forces of the socialist countries was broadened materially. Long-term planning has been improved, which is a prerequisite of a rational and more complete division of labor among the socialist countries. In all of the countries of the socialist camp the material and technical base was strengthened, the technical level of production was raised, and the division of labor within each of the national economies was extended. The gross industrial output of the socialist countries in 1960 exceeded the pre-war level by approximately seven times. The socialist countries accumulated much experience in socialist economics, international economic co-operation and international division of labor. New forms of combining the productive efforts of the countries in order to solve the economic tasks confronting them, forms inherent in the world socialist system only, have been discovered and put into practice. The most important of these is co-ordination of the national economic plans, which ensures the most harmonious combination of the national and international interests of the working people of the socialist countries, systematic and proportional development of the national economy of each socialist country and the world socialist system as a whole.

Transition to the new stage in the division of labor between the socialist countries became possible also as a result of the great and fruitful work being done to improve the system of socialist international division of labor by all of the socialist countries and the Council of Mutual Economic Assistance. In particular, work has

een initiated to elaborate scientific principles and ndices of socialist international division of labor, o work out a method of comparing national income, abor productivity, production costs, effectiveness f capital investments and other national economic ndices of the socialist countries. Completion of ne working out of these problems will create the ecessary prerequisites for determining the most ffective and rational directions and forms of the rther development of the division of labor beveen the socialist countries.

The main forms of division of labor among the ocialist countries, based on co-ordination of eir national economic plans, are now the follow-g: specialization and co-ordination of production interdependent branches of industry and agri-ulture; division of labor in joint utilization of aw material, fuel and power resources, as well s in joint construction of large national economic rojects; division of labor in the development and ilization of various types of transport and com-unications facilities; and division of labor in e advancement of science and technology, in-uding the training of specialists and the raising their skills.

The highest forms of socialist international di-sion of labor are specialization and co-ordination production in interdependent branches of the tional economy. These forms of labor division rovide the utmost possibility to rationally employ e natural riches, productive capacities and man-wer resources of each socialist country in its tional interests and in the interests of the entire cialist camp, to eliminate unjustified parallel-m in the development of national economic anches, to increase serial production, enhance s technical level, improve the quality of goods oduced, and lower costs.

It is only in the conditions of the world socialist stem that specialization and co-ordination of oduction are effected on a mutually advantageous, ual and voluntary basis and promote rounded, rmonious development of the economies of all e socialist countries. Unlike under capitalism, ternational division of labor under socialism tionally blends international specialization in rious types of production in the interdependent anches of the national economy with the creation d development of the most effective national onomic complexes in each of the socialist coun-ies. These complexes include, in optimum oportions required by the branches of industry, riculture and transport, the given country and e entire socialist camp, the raw material and anufacturing branches of industry, and the output means of production and consumer goods. ch division of labor promotes the industrial de-lopment of all socialist countries, helps them make the fullest possible use of their internal resources and ensures the rapid growth of the productive forces of the whole world socialist system.

Among the very important problems in the development and improvement of socialist international division of labor is that of the specific operation of the law of the priority development of means of production in the conditions of specialization and co-ordination of production in the world socialist system. This problem is of major importance not only from the theoretical but also from the practical angle, inasmuch as a number of socialist countries are now drawing up national economic development plans for the period up to 1980.

The view has been expressed in our literature that under the conditions of developing socialist international division of labor there is no need for priority development of means of production in every socialist country, that this principle should be followed only in the world socialist system as a whole.

In our opinion such an assertion is incorrect. Specialization and co-ordination of production in the socialist countries not only do not exclude but on the contrary require the priority development of means of production in each socialist country and create very favorable conditions for it. At present the world socialist system represents a combination of sovereign, independent countries in each of which the national economy develops as an independent economic organism. In connection with this, socialist reproduction can be successfully expanded in each of these countries, the technical level of production and labor productivity can be constantly raised, and the material and technical base of socialism and communism can be built only if priority is undeviatingly given to the development of means of production in each of the socialist countries. This is also the prerequisite for the gradual elimination of the historically formed differences in the levels of economic development of the socialist countries and for the creation of the material base for their more or less simultaneous transition to communism.

In this we consider that the means of production include not only machines, equipment and the produce of other manufacturing industries, but also diverse fuels, mineral raw materials and other mining output. As is known, the means of production also include a considerable part of agricultural output, including certain grains, cotton and other industrial raw materials of agricultural origin, productive and working livestock, etc.

Although the creation of the engineering industry, as well as the development of other important manufacturing branches, is of vast

importance for the economic development of each socialist country, priority development requirements should be observed in the case of all types of means of production and not only for means of production put out by the manufacturing branches of industry. If they are not observed, the raw material, fuel and power base will inevitably lag behind the manufacturing branches and this will lead to difficulties and disproportions throughout the economy. To ensure a faster rate in the development of the raw material and power branches is one of the important problems confronting the socialist countries.

Economic co-operation, mutual assistance and international division of labor in the socialist camp facilitate the successful implementation of Lenin's policy of the priority development of means of production in all socialist countries. We present below the corresponding data for the socialist countries:

	Increase Achieved			Planned Increase According to Long-Range Plans		
	Years	Total Industrial Output	Including Means of Production	Years	Total Industrial Output	Including Means of Production
USSR	1913-1959	40 times	93 times	1959-1965	80 %	85-88 %
KNR	1949-1959	13 "	29.6 "	—	—	—
Poland	1949-1959	3.9 "	4.3 " *	1961-1965	52 %	57.2 %
Czechoslovakia	1948-1959	3.3 "	3.8 "	1961-1965	56.4%	70 %
GDR	1950-1959	2.7 "	3.5 **	1959-1965	88 %	95 %
Hungary	1949-1959	4.3 "	—	1959-1965	65-70%	70-75 %
Rumania	1938-1959	4.3 "	5.7 "	1960-1965	110 %	120 %
Bulgaria	1939-1959	11 "	23 "	—	—	—
Albania	1938-1959	22.5 "	—	1961-1965	52 %	54 %
KNDR	1956-1960	3.5 "	3.7 "	1961-1967	2.5 times	—
MNR	1947-1958	2.4 "	4.8 "	1960-1965	2 "	—

* Group "A."
** Engineering and metalworking output.

The need for the priority output of means of production in each socialist country does not exclude the fact that some of them may, with a view to solving certain economic problems, develop for a brief period both sectors of social production at the same pace or even give preference to the output of consumer goods. But on the whole, over more or less prolonged periods, the priority development of means of production is the law of economic development of every socialist country.

It is also necessary to point out that close economic co-operation, mutual assistance and rational division of labor among the socialist countries make it possible to reduce somewhat the gap between the rates of growth in the heavy and light industries in comparison with the gaps which existed, for instance, in the Soviet Union in the years of the first five-year plans, when it was building the material and technical base of socialism in conditions of capitalist encirclement. Moreover, thanks to the existence of the world socialist system, individual socialist states do not have to produce all types of means of production but only a certain part of them on the basis of international specialization and co-operation, which makes possible a rapid rise in the technical level of production and the growth of social labor productivity.

Socialist international division of labor enables every socialist country to develop the engineering branches which are essential for its economy. This is an indispensable factor for the continued rise in the rate of technological progress and labor productivity in the national economy of each country. At the same time it is economically inexpedient and actually impossible to develop all branches of modern engineering in every socialist country.

The most important factors taken into account in determining the profile of the engineering

dustry in the socialist countries are the structure the national economy and the prospects for anges in it, the nature of the available fixed apital for the engineering industry, the availabil- y of the metallurgical base, and production ex- erience. Within the framework of socialist in- rnational division of labor, most of the socialist ountries concentrate their efforts chiefly on the evelopment of the engineering branches whose roduce is in most demand on the home market oth for equipping new branches and for the tech- cal renovation of ones already in existence. Re- uirements of the other socialist countries for is output are also taken into account. They also xpand and improve the traditional engineering ranches and the output of unique types of engineer- g goods. In this case the more developed social- t countries render all possible economic, sci- ntific and technical assistance to the less devel- oed ones. At the same time due account is taken the state and prospective growth of the metal- rgical base. This is important not only for re- ucing the expenses for transporting the metals t also for rapidly and effectively adapting metal- rgical production to the changing requirements engineering. That is why the biggest metal- onsuming branches of the engineering industry re located chiefly in countries with the most de- eloped metallurgical base (the USSR, Czechos- vakia and Poland), while the branches consuming ss metal (electrical engineering, instrument- aking, etc.) are located mainly in countries with ss developed metallurgical bases.

In the period of implementing the current long- rm national economic development plans, the ocialist countries concentrate most on the spe- alization of their engineering industry in the asic, constructionally and technologically, homo- eneous groups and types of production, as well s on specialization in the production of equipment r entire production lines. It is mainly from is that the SEV countries proceed in adopting ecisions on specialization and co-ordination of oduction of more than 1,000 different types of achinery and equipment and on their mutual ex- anges subsequently.

An important long-term tendency in the division labor in engineering among the socialist coun- ies is the inter-state co-ordination of production rough the specialization of certain countries in e output of machine parts and details. One pre- equisite for the development of this form of bor division is large-scale and rapid normali- tion, typification and standardization in the ocialist camp countries, especially in the case the goods, parts and elements for which it is ore expedient to organize mass, serial produc- on and which can be made an object of interna- onal exchange.

Interstate specialization and co-ordination are an important factor for the rapid increase of engineering production and its technical improvement. In the years of the present long-term plans gross output of products in the Soviet Union will increase 2 times, in the German Democratic Republic — 2.18 times; in Poland the output of engineering products and metal structures will increase by 75.8%; in Hungary engineering production will grow by 82 to 86%, in Czechoslovakia — 83%, in Rumania — 2.2 times. Soviet machine and equipment deliveries to the people's democracies will increase 2.2 times between 1959 and 1965, while the deliveries from the people's democracies to the Soviet Union will rise 2.3 times.

The task before the socialist countries now and during the long-term period is to speed up the development of the chemical industry and particularly the output of plastics and synthetic materials. The diversified assortment of chemical goods and the high economic effectiveness of the large production units in this branch, which make it possible to make complex use of raw materials and to reduce production costs, as well as the big role research plays in intensifying production, make it indispensable for the socialist countries to practice labor division on a large scale in the development of this branch, especially in the case of the products which require large capital outlays, unique equipment and highly skilled personnel. The main factor in specialization of chemical production in the individual socialist countries is the availability of appropriate raw materials, power sources, special equipment and the required personnel.

The socialist countries strive to develop chemical production primarily on the basis of their own raw materials, as well as on the basis of imported raw materials whose freight does not entail large outlays and whose processing domestically ensures their complex utilization. Such important and mass products of basic chemistry as sulphuric acid, chlorine, ammonia, etc., are produced in every socialist country. As for the output of plastics, chemical fibers, mineral fertilizer, dyes, synthetic rubber and certain other products, their successful development in many countries can be ensured only on the basis of rational international specialization.

In accordance with the recommendations of the 11th and 12th Sessions, the output of certain kinds of plastics and synthetic fibers of major national economic importance will be developed at a high rate in all of the socialist countries through the use of gases obtained from oil-refining and natural gases. It is planned that countries will specialize in producing different

kinds of synthetic rubber, this to depend on the availability of the necessary raw materials and production capacities. The production of nitrogen and phosphate fertilizers is envisaged for all the countries, while that of potassium fertilizer only for those who have the necessary reserves of potassium salt. Specialization and co-ordination covers about 500 items of the chemical industry of the SEV member countries (about 80 to 85% of its over-all volume), which will help to speed up the development of this important branch in all of the socialist countries. The volume of chemical output in 1965 will be four times that of 1958 in Bulgaria and Rumania, 2.5 times in Poland, 2 times in the German Democratic Republic, Hungary and Czechoslovakia and almost 3 times in the Soviet Union.

Economic co-operation among the socialist countries in agricultural development is expanding. The 12th Session of SEV discussed the question of increasing the output and mutual exchange of wool, oil-bearing raw materials, vegetables, fruit and grapes. The recommendations adopted provide for a substantial increase in these items between 1959 and 1965. Compared with 1958, the output of wool will increase 1.7 times by 1965, fruit — 1.7 times, grapes — 2.1 times, vegetables — 1.9 times. The session took note that the most favorable conditions for cultivating fruit, grapes and vegetables obtain in Albania, Bulgaria, Hungary and Rumania.

In conformity with the decisions of the February (1960) Conference of Representatives of the Communist and Workers' Parties of the European Socialist Countries, a study is now being made of the possibilities for further specializing agricultural production, as well as agricultural machine-building and the production of diverse chemical means for agriculture.

* * *

Division of labor among the socialist countries in the joint utilization of their natural wealth (raw material, fuel and water power reserves) and also in the joint construction of large national economic projects is being extended each year with the aim of accelerating the expansion of the raw material, fuel and power base and utilizing to the maximum the resources of the socialist countries. This form of international division of labor is closely linked with specialization and co-ordination of production in the socialist camp and, essentially, is one of their varieties. It helps to co-ordinate the efforts of the socialist countries in the search for and rapid utilization of the biggest and the most profitably exploitable deposits of important minerals on the basis of up-to-date technique and technology, specialization and co-operation among the socialist countries with a view to maximally increasing the output of new types of raw materials and fuel, and elimination of the lag in the raw material, fuel and power branches of industry.

In the early post-war years, when most of the people's democracies had neither the necessary experience in production and organization nor qualified specialists, this form of co-operation was developed mainly through the establishment and common operation of joint enterprises. In subsequent years, when these enterprises had fulfilled the tasks set them, they were turned over completely to the people's democracies on whose territory they had been built.

At present, co-operation among the socialist countries in the joint exploitation of natural resources and the joint construction of national economic projects is achieved on a new basis. The jointly built projects are the national property of the countries where they are located. Payment for the material and technical assistance given by the fraternal countries in the establishment of these enterprises is usually made in the raw materials and finished goods produced at the enterprises thus built.

Co-operation among the socialist countries in the mutual supply of their metallurgical, chemical and other branches of industry with raw materials is growing with each year. Taking into account its own needs and the requirements of the fraternal socialist countries, the Soviet Union is increasing its output of high-quality iron and manganese ores and their delivery to these countries. By the end of the present Seven-Year Plan period iron-ore output in the Soviet Union will reach 150 to 160 million tons and deliveries to the European people's democracies will rise to 24 million tons (as against 3.2 million in 1950 and 13.2 million in 1959). The output of iron and nickel ores in Albania and of iron ore in Bulgaria is being increased with the assistance of socialist countries, notably Czechoslovakia. The aim is to help these two countries to build up their own ferrous metal industry and increase the iron and nickel resources in the SEV countries.

The 12th SEV Session approved measures for improving the technology of iron-ore concentration and increasing the resources of technological fuel for the ferrous metal industry. The output of coking coal in the European people's democracies will increase in 1965 by 53.5% over 1958.

Soviet iron-ore and Soviet, Polish and Czechoslovak coke deliveries will aid in the rapid expansion of the metallurgical industry in the socialist countries. Compared with 1958, the smelting of pig iron in the European socialist countries in 1965 will be 1.8 times higher, steel

nd rolled goods — 1.7 times and steel pipes — lmost 1.9 times. Considering that the ferrous ietal industry requires a vast amount of materials, s distribution in the socialist countries is deter-ined first of all by the availability of the neces-ary raw materials and technological fuel. Metal-rgical enterprises with the full cycle of produc-on are being built chiefly in countries capable of upplying them fully or to a large extent with their wn resources of ore and coke, while the estab-shment of those using power (electric steel, luminum, ferroalloys) takes into account the lo-ation of the fuel and power branches of industry.

The socialist countries also co-operate in de-eloping the raw material base of the non-ferrous ietal industry. With this aim in view, Czechos-ovakia and Bulgaria have concluded an agreement r the joint construction of a mine and a concen-ation plant to exploit the copper-ore deposits rveyed in Bulgaria. Czechoslovakia has also anted a credit to Poland to increase the output the large deposits of copper ore recently un-overed in Poland.

Of great significance for the economies of the aternal socialist countries are the Soviet de-veries of oil, which is such an important type fuel and source material for the chemical in-stry. This helps significantly to improve the ructure of their fuel balance and speeds up the velopment of their chemical industry. Soviet l deliveries to the European socialist countries ill increase from 5.3 million tons in 1959 to out 15 million tons in 1965. To ensure an un-terrupted flow of this amount of oil and reduce eight expenses, the Soviet Union, Poland, echoslovakia, the German Democratic Republic d Hungary are building a main pipeline, the ggest in the world, which will link the Volga ea with the above-mentioned countries.

The socialist countries are expanding co-opera-n and mutual assistance for the development of e coal industry in Poland, which possesses rge reserves of high-grade coal, and for ex-itation of Polish sulphur deposits. With this m in view, Czechoslovakia and the German mocratic Republic have granted Poland special edits and are supplying her with the necessary uipment. Rumania, Czechoslovakia, Poland d the German Democratic Republic are building large cellulose plant near Braila in Rumania th an annual capacity of 200,000 tons. This ant will make it possible to use the vast re-rves of the cheap raw material, cane, which cupy an area of 430,000 hectares in the Danube lta. It will also enable the countries building to satisfy a substantial part of their require-nts in cellulose. The large chemical works ich have been built in Hungary will use manian natural gas as a raw material.

The division of labor among the socialist countries is expanding in the power industry. In view of the present character and rate of scientific and technological progress, the countries of the socialist camp attach great importance to developing their electric power capacities to the maximum, to uniting their efforts in exploiting the richest, most accessible and effective (in terms of exploitation) power sources, and to achieving a rational division of labor in this sphere. This labor division considerably improves the structure of the socialist countries' fuel and power balance and increases the utilization of electric power in industry, thereby raising labor productivity. The rapid development of the electric power industry in the socialist countries creates the prerequisites for increasing electric power output substantially within the next few years. This is of particular importance if one considers the fact that in 1959 the socialist countries accounted for more than one-third of world industrial production and only for about 20% of world electric power output.

Agreements on mutual deliveries of electric power have been concluded between many European socialist countries and between the People's Republic of China and the Korean People's Democratic Republic. Differences in supplies of power resources and in the conditions of their use, as well as in "peak" periods in the power systems of the socialist countries, make it economically expedient to set up large, unified power systems. This is already being done. The establishment of unified power systems will reduce capital investments in power in each socialist country, decrease the necessary reserves of capacity and the "peak" period overloading through the co-ordination of power supply. The socialist countries are building electric power transmission lines to unite the power systems of the European part of the Soviet Union, Poland, Czechoslovakia, the German Democratic Republic, Hungary and Rumania.

To expand this exchange of electric power, Czechoslovakia is helping Rumania to build large thermal electric power stations that will work on natural gas. Part of the power generated by these stations will be transmitted to Czechoslovakia and Hungary. Poland and Czechoslovakia have built a large thermal electric power plant at Novy Dvory on the Polish-Czechoslovak border. It is equipped with Chechoslovak machinery and uses Polish coal. The electric power it generates is used by both countries.

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The socialist countries' co-operation and international division of labor in transport is also

developing successfully. In the early post-war years co-operation in this sphere proceeded mainly on the basis of bilateral agreements. To co-ordinate the development and employment of all types of transport and for co-operation in international haulage and in the study of transport problems, the SEV countries set up a Permanent Transport Committee in 1958 at the 11th Session of SEV. In 1960 the members of SEV concluded a multilateral agreement on freight and passenger traffic. This agreement provides for the unification of their railway systems and rates, as well as for mutual privileges for cargo hauls. In particular, daily rates for the use of cars are lower than in Western Europe.

To expand their co-operation in transport and co-ordination of international haulage for all socialist countries, the Soviet Union and all the people's democracies in Europe and Asia have set up the Organization of Railway Co-operation (OSZHD). This organization helps to co-ordinate and solve the operative problems concerning railway haulage in the socialist countries, joint research and construction work, and the exchange of production experience and technical achievements in the development and employment of transport facilities.

The most important problems of interstate co-operation in the sphere of railway transports are the creation of a pool of European-gauge freight cars and the opening of joint border stations. This will make it possible to raise the co-efficient of employment of transport facilities in international haulage, reduce the number of empties and ensure, through the joint effort of all countries, the deliveries of necessary cargo from individual countries, especially during the so-called "peak" periods.

The socialist countries co-operate in the construction of transport main lines and projects. The Soviet Union, Poland, Czechoslovakia, Hungary, Rumania and Bulgaria have built a big bridge across the Danube in the area of the Rumanian town of Giurgiu and the Bulgarian town of Ruse. The Soviet Union, the People's Republic of China and the Mongolian People's Republic joined efforts in building a railway line from the Chinese town of Tsinying to Ulan Bator, thus linking the capitals of the three countries by a direct railway line and cutting down the distance between Moscow and Peking by about 1,000 kilometers. The Soviet Union and China are now building the Lanchow-Urumchi-Alma Ata railway line.

The Soviet Union and the European people's democracies also co-operate in developing their water transport. In pursuance of the recommendations of the SEV Permanent Transport Committee, an agreement on direct railway-water haulage on their railways and on the Danube, was concluded in Sofia in December 1959. The agreement provides for hauls with single documents and with single rates, a thing that will benefit both the shippers and the receivers. The organization of joint railway-shipping communications will enable the socialist countries to use their transport facilities and possibilities more rationally.

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There is widespread division of labor among the socialist countries in science and technology, including specialization and co-operation in research, experimentation and designing work, and the subsequent exchange of results. Large-scale, planned, equal and mutually advantageous division of labor in this sphere is possible only in the conditions of the world socialist system. The distinguishing feature of this co-operation, one inherent only in the world socialist system, is that it entails no compensation. For the first time in interstate practice, the socialist countries exchange, without charge, planning-technical documents on the capital construction of economic, cultural and public service projects, as well as on the manufacture of important types of machines and equipment. They also exchange licenses for inventions and technical improvements and experience in labor organization and technology of production. There is also labor division among the socialist countries in the training of personnel for the various branches of the national economy and for the raising of their qualifications.

Division of labor in science and technology allows the socialist countries to spend less effort money and time for new capital construction, increase the stock of machinery and equipment, introduce the most up-to-date technology, complex mechanization and automation of production and accelerate the rate of technical progress in the national economy.

In line with scientific and technological co-operation, the Soviet Union in the period between 1948 and 1960 supplied the other socialist countries, free of charge, with 28,817 sets of scientific and technical documents on the capital construction of economic projects and the manufacture of diverse machinery and equipment, and received 7,048 sets of documents in return. In this same period 19,100 specialists from the people's democracies engaged in production practice and studied the latest scientific and technological achievements in the USSR and 11,601 Soviet specialists visited these countries. At present 330 Soviet research institutes co-operate with 405 kindred organizations in the people's democracies. They jointly conduct

esearch work on 3,500 subjects of mutual interest. In these years the people's democracies also exchanged tens of thousands of sets of technical documents, standard specifications and patents, results of experiments, study syllabuses, specimens, etc.

Scientific and technical co-operation within the socialist camp has made it possible to solve many important technological and economic problems in various branches of the national economy. This co-operation is an important factor in raising labor productivity rapidly and expanding social production in the world socialist system.

The continued development and improvement of the system of the socialist international division of labor play a big role in the steady expansion of the economies of the socialist countries and thus raises the material well-being and the cultural level of the masses in the course of the construction of the material and technical base of socialism and communism.

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Aganbegian (CONTINUED FROM PAGE 31)

educed by 11%, additional employment of labor ower covered only 1% of this time. The remaining 0% was made good partly by additional organizational and technological measures and partly by increased labor intensity. With the reduction of the working day, the increase of labor productivity in industry in 1959 was 7%, in 1960 — more than 5%, and in 1961 it is planned to increase it by 6%.

(7) See "Iz Neopublikovannykh Rukopisei K. Marksa," Bol'shevik, 1939, No. 11-12, p. 65. [All quotations from non-Russian sources have been re-translated from the Russian — Editor].

(8) The introduction of a minimum wage of 50 to 60 rubles is scheduled for the years 1963 to 1965 and the transition to the five-day working week for 1964-1965. There is a possibility, therefore, of effecting both of them simultaneously in different branches in 1964-1965.

(9) Arkhiv Marksa i Engel'sa, Vol. IV, p. 119.

(10) "Iz Neopublikovannykh Rukopisei K. Marksa," loc. cit., p. 65.

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Khachaturov (CONTINUED FROM PAGE 48)

hare of building and assembly work to 55% of the otal volume of capital investments by the end of 965 and even more in future. Reduction of the cost f building and assembly work will be an important ictor in cutting capital investments per unit of output and production costs.

Our country's entry into the period of the comrehensive building of communism has aroused an nusual upsurge in the working people's social and olitical consciousness: it is manifested in the wide ovement for the lofty title of communist work eam or plant. The successes of this national movement in raising labor productivity and expanding output testify to the large possibilities for the growth of production, for further increasing the economic effectiveness of capital investments and accelerating the tempo of building communism.

Footnotes

(1) Here it is necessary to take into account the tendency which changes the relationship between materialized and living labor in the opposite direction: the development of technology and the growth of labor productivity in Department 1 cause a decline in the replacement value of the fixed capital.

(2) V. I. Lenin, Sochineniia, Vol. 4, p. 103.